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VOL. II.—42ND YEAR

SYDNEY, SATURDAY, AUGUST 13, 1955

No. 7

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### OVER THE HILLS AND NOT SO FAR AWAY.<sup>1</sup>

By F. KINGSLEY NORRIS, C.B., C.B.E., D.S.O., E.D., M.D., Q.H.P., F.C.N.A.,

Major-General, Royal Australian Army Medical Corps;  
Director-General of Medical Services, Australian  
Military Forces.

I MUST thank you sincerely for the honour and the privilege of addressing you tonight.

This conference is an important occasion. The historical fact is here recorded and will remain for all time, that in 1954 the medical profession of the Townsville area ventured beyond the safeties of the past as did the pioneers in this vast region ninety years ago.

May I remind you briefly of those times and of the remarkable Robert Towns, in whose honour your city was named by Surveyor-General Gregory? Towns was born of humble parents at Long Horsley, Northumberland, on November 10, 1791. Like many of those born north of the

Humber, he possessed a rugged determination and individualism. After a short period in the village school, Towns became apprenticed to a collier plying between Shields and London. All his spare time was given to study, and at the age of sixteen years he qualified as mate; a year later as master. When he was twenty years old, Towns was given command of a brig in the Mediterranean-Levant trade. He was not only a skilled seaman, he was also a careful, canny young man, and he saved sufficient money to order the construction of his own famous clipper *The Brothers*. You may see a fine painting (in the Mitchell Library) of this spanking ship approaching Sydney Heads, where he arrived for the first time in 1827, at the age of thirty-six. At that time the transport of immigrants was a prosperous trade for ship-owners, and Towns's ship *The Brothers* was reputed to be the fastest and best-managed sailing vessel on the run. His was the first ship to take back to England a cargo consisting entirely of wool. After six years of this thriving trade Towns married the sister of William Charles Wentworth, but there was little home life for roving Bobby Towns, and he was steadily building a large fortune.

In 1842 a depression began in New South Wales, the country appeared saturated with people, unemployment was

<sup>1</sup>Inaugural address at the Townsville Medical Conference, August 30, 1954.

increasing, prices and wages were falling. Squatters were selling their live sheep for half a crown or boiling them down for five shillings' worth of hide and tallow, our first secondary industry. Towns, at this time aged fifty-one years, began to look ashore for his future activities. And at this period of uncertainty and depression, where all around him was turmoil, Towns exhibited his supreme courage. By his relentless energy, financial ability and vision he established a successful shipping and trading agency under the name "R. Towns". Towns's Wharf at Miller's Point became a famous centre of trade, extending into the Far East, into the whaling industry, and around the coast of Australia. He initiated a Royal Mail Packet line between Sydney and England, and became a director of the Bank of New South Wales.

Following the discoveries of Leichhardt and the explorations of Sir Thomas Mitchell, investors were turning to country which is now Queensland, but which at that time was northern New South Wales. Towns took over extensive holdings on the Burdekin and in other parts, and later began what as far as I know was his only failure—the importation of kanakas for the growing of cotton along the Logan River in 1855. Towns was elected a member of the Upper House of New South Wales first in 1856, and became "the Honourable", and his interests had so developed that he took into partnership Alexander Stuart, an inspector of his bank. (Stuart was later knighted and became Premier of the State.)

Wealth—pastoral wealth, mineral wealth—lay in and over the mountains of north Queensland; but the products of this wealth were difficult of access. The ports of Bowen and Cardwell were reached only over rough mountainous tracks. John Melton Black, Towns's manager of his Burdekin properties, dispatched two of his staff, Andrew Ball and Mark Reid, to seek a shorter and better route to the sea coast. They discovered the Ross River discharging into Cleveland Bay, and their report was sent to Towns in Sydney. It is due to the decision and vision of Towns that your city came into being in 1864, when the first dwelling was erected on Melton Hill by Mr. E. G. Rowe, from sawn tea-tree on the edge of the lagoon. On February 15, 1866, the Australian Steam Navigation ship *Rangatira* arrived in Townsville with the Honourable Robert Towns aboard. The occasion was marked by a banquet at the Criterion Hotel, and Towns was elected the patron of the first Townsville Hospital and president of the local turf club.

Towns pushed inland, and by his energy and determination acquired sufficient influence to impress the Queensland Government. Gradually this isolated area became associated with more favoured towns and cities to the south. The telegraph came through from Bowen in 1869; some years later, the railway—but not always were blessings bestowed. In the face of devastating hurricanes in 1867 and 1870, and of the great fire of 1877, when £28,000 worth of damage was done, these robust pioneers remained steadfast and undaunted as Townsville triumphed over disaster, and today we are gathered here because of the courage, the endurance, the vision of Robert Towns and those noble men and women who determined that whatever the hurt, whatever the hardship, those coming after them would prosper in contentment by their effort.

In 1873 Robert Towns, the great apostle of enterprise in the days of iron men and wooden ships, died in his eighty-second year at Cranbrook, a home that has been graced by three governors of New South Wales and is now a famous boys' school.

In his last illness Towns was attended by Dr. George Bennett, a leading Sydney doctor of the day, who had come to Australia by Towns's famous clipper *The Brothers*.

Not only was there hardship in those days, there was danger; but because of Australia's relative geographical isolation the dangers were from within their environment. Today, if we open our eyes and use our brains, we realize that once again we are in danger; but now our dangers lie not only from within, but also from abroad.

It is of these dangers that I wish to remind you tonight. Whatever our walk of life, be it professional, industrial or of the business world, we always remain citizens of a community wherein we have elected to live, with the great privileges that this implies and the tremendous responsibilities it imposes. If we are not prepared to accept these, then let us move elsewhere, as we are free to do. The aim of this conference is not only to make us better doctors in our own right, but also as better citizens to discharge more efficiently our obligations of service within the community.

There may have come to your notice a remarkable document, "The Call to the People of Australia". If you know of this document, repetition is of value; if you are unaware of it, pronouncement should prove inspiration. The genesis of this document is of interest. It began with the wisdom of Lieutenant-General Sir Edmund Herring, Chief Justice of the Supreme Court of Victoria. Then Sir Edmund Herring there can be no more sincere personification of the vision of Cecil Rhodes, whose scholarship Sir Edmund held at Oxford. Sir Edmund Herring moved around Australia as Director of Recruiting, and became increasingly disturbed by the apathy of so many in our Commonwealth. In Melbourne one day in 1951 he called together over breakfast a number of prominent citizens of all walks of life. After the meal Sir Edmund Herring put to the gathering his disquietude and asked for their honest opinion. "Am I right in my thinking", he asked, "or is my outlook and sense of value distorted?" Unanimously around the table it was agreed that there was sound reason for serious uneasiness. What was to be done about it? It was decided that the first step was a pronouncement of our dangers, together with a constructive inspiration towards meeting them. A document known as "The Call to the People of Australia" was drawn up. Such a statement, to be of worth, must be issued with authority. Since it was realized that any decent community must be based on spiritual faith and law and order, the heads of all the churches in Australia, together with the senior judicial authority in each State, were invited to sponsor this document with their respective signatures. For the first time, the various Protestant denominations, the Roman Catholic Church and the Jewish spiritual head came together with the Chief Justices in one statement. This alone would mark "The Call to the People of Australia" as an important historical document comparable with the great charters over the ages. "The Call" begins:

There are times in the histories of peoples when those charged with high responsibilities should plainly speak their minds. Australia is in danger. We are in danger from abroad. We are in danger at home . . . Our present dangers are a challenge to us—but in meeting the challenges of history peoples grow in greatness.

Within a few days I shall leave Australia early one morning. By four o'clock that afternoon I shall be in Japan, one of the loveliest countries in the world, especially in the burning glow of autumn, a country of the most industrious people, who are enjoying perhaps the fewest of amenities, one of the most literate countries, and a country of calamity where each day somewhere there is a fire or an earthquake; a country where the family has faithfully assumed the care of the aged as a normal responsibility, and where each year at least 5,000,000 babies are born and under the improving public health service have a reasonable chance of surviving. Above all, the Japanese people are the most obedient—whom will they obey? An hour's flight across the straits of Tsushima, where lies the graveyard of Rhodovenski's huge armada sunk during one afternoon in 1905, we are in Korea.

Have you ever given heed to the significance of the war in Korea? There, at this very moment, there is a "cease fire" during which more than 1,000,000 men from more than 20 nations are standing to their arms and their arms are loaded.

Korea also is a country of calamity. Over the centuries these poor primitive people have been enslaved by the Tartars, the Chinese, the Russians and the Japanese; their culture and their ceramic art have been ruthlessly raped from them and claimed as their own by their



conquerors. They emerged from the veil of seclusion even later than Japan. At the end of the war, for the first time in centuries the Koreans were in possession of their own land; but they were uncertain and bewildered, blinking in the unaccustomed brightness of freedom. In 1945 it was agreed by the United Nations that the Koreans should be fostered until they were ready to resume their country. From the Yalu down to the thirty-eighth parallel the Union of Socialist Soviet Republics was to be sponsor; up to this arbitrary line the United States of America would act.

What is the significance of the United Nations? After World War I the nations came together in the realization of the futility of war and determined that differences and misunderstanding between nations should be adjusted by peaceful counsel and not by war. Such an ideal is the rightful responsibility of any decent country or individual; but responsibility without power is futile, and when Germany marched into the Ruhr, when Italy conquered Abyssinia and when Japan invaded Manchuria, the League of Nations was powerless in its rightful resentment and World War II became inevitable.

Once again, when this was over, the nations came together; but this time each member nation pledged its word that the ideal would be upheld if necessary by force of arms. To our enduring pride we remember that Australia is a signatory to this pledge of the United Nations.

In 1948 it was agreed that the Koreans were ready for the responsibility of determining their own government and of administering their own country, and the sponsors in the south withdrew and ostensibly so did those in the north. An election was held to determine the president and government of the Republic of Korea; but the restriction of communism remained in the north, and Syngman Rhee and his government were elected mainly on the votes from below the thirty-eight parallel.

Soon afterwards, with no justification but sheer brutality and the practice of a ruthlessness inspired by their dictators in the safety of the Iron Curtain, those in the north drove down from the mountains over the poor people of the south.

The Japanese during their occupation of Korea had trained the people into some kind of primitive army, but very cleverly had not permitted any Korean to rise above the rank of sergeant; there were no Korean officers, and when the fanatical communist-driven horde from the north rushed upon them they broke into a fleeing rabble. Once again there was a challenge. The United Nations faced again the problem of the Ruhr, of Abyssinia, of Manchuria, but this time the pledge was kept. The decent nations kept their word, and men of all colours and creeds from more than twenty nations rushed to Korea just in time. The remnant of the south was penned in a narrowing area around Pusan—the Taegu Box.

Brutality and aggression were not to pass unchallenged whatever the cost, and in three years of bloody war in that grim country the cost was paid; but we kept our word.

That is the meaning of Korea.

The world now knows that decent nations keep their word. There is a "cease-fire" in Korea. We know what has happened in Indo-China and in the seas around, all well within one day of Australia. We are uneasy, and we must be aware of the reality of this danger from abroad during this momentous pause. Possibly never has this danger to Australia been more urgent.

But there is also great danger from within; I do not refer only to the disturbing disclosures at the Royal Commission. No one with eyes to see, with ears to hear or a brain to think can fail to be aware of the insidious infiltration of the dreadful doctrine of dialectic materialism within Australia. Rather do I refer to our apathy, to our complacency, to our supine acceptance of the God-given gifts of health and happiness and of prosperity, that are more bountifully bestowed on Australia than on any other country, and to our indifference towards individual effort designed to advance or even to maintain these.

We are "sitting pretty"; with less effort we are doing better materially than ever before, while around us are peoples working harder, even slaving, and reaping an infinitely smaller reward. We are prosperous largely because of our wool; and even if this failed, oil and uranium will continue this prosperity—for a while.

Prosperity is right. Without prosperity there can be no happiness or contentment; but no community ever continued in prosperity without tribute, without effort.

Great blessings have been granted to medicine in our lifetime. Certain diseases, such as typhoid and diphtheria, which filled our hospitals are disappearing or have gone; with the magnificent lead given to us, that Captain of the Men of Death, tuberculosis, is "taking the count". Poliomyelitis will soon join this company. Today we are the only country in the world where smallpox is not endemic. Cancer is commanding expert attention throughout the world and must soon emerge from its mystery; but the ignoble and unnecessary toll of the road has not fully awakened our conscience.

In the filthy disease-ridden country of Korea, during three years of war, only three of our men have died of disease—this in an area where it would be impossible to introduce germ warfare—all the deadly germs are there. Of each 100 men wounded in battle or not killed immediately, barely two now die of wounds. Malaria, which was known to kill at least 6,000,000 people each year, is well within our control.

These are remarkable advances. I venture to predict that fifty years hence people with few exceptions will just wear out or be killed.

We have been granted the mastery of a host of antibiotics which probably have saved millions of lives that may well have been lost before their advent; but great as these blessings undoubtedly have proved, they also possess their dangers. Let us cast our minds back to when we were students. Gonorrhœa was a serious illness; the scourge of syphilis was rightly dreaded. The fear of contagion by these two diseases kept many a man on the straight and narrow path, and the appearance of an infection often led to the isolation and treatment of its source. But now gonorrhœa may be cured within twenty-four hours, and syphilis responds rapidly to penicillin, and the sources of infection go unheeded. There appear to be abroad a period of relaxation of sexual morality and a tendency to greater and more youthful promiscuity. As Sir Alexander Fleming, to whom we owe the understanding of penicillin, put it: "The fear is fading and there is no religious revival to take its place."

The surgeon now knows that his two great enemies, the streptococcus and the staphylococcus, are defeated, and here lies a danger in the relaxation of the sound aseptic precautions which have developed since Pasteur and Lister showed the light. But no antibiotic is any excuse for inefficient surgical care.

In the "bad old days", when we recovered from typhoid and many other diseases—and let us never forget that even in those days most of us did recover—we developed and retained our resistance sometimes for our lifetime. But now again, as Florey has indicated, antibiotics act so rapidly that the organisms are overcome before they have the power to stimulate our immunity. When we recover we may have another attack within a few days. Chloramphenicol is a rapidly effective drug in typhoid fever; but relapses are increasingly common, and even subsequent attacks, in a disease which before antibiotics conferred lifelong immunity.

Do not for one moment believe that I decry these drugs—only a crank would subscribe to this; but I am reminding you of their dangers and of the odd, disturbing illnesses we are seeing now that we have destroyed so many of the well-known organisms with our blunderbuss loaded with multiple antibiotics and fired with empirical aim.

I have referred in other places to the increasing danger of mechanized medicine, and of the reliance on shadows and results of detached laboratory tests rather than on the

Intelligent use of our eyes, our ears, our fingers and our noses, and on our ability to take an intelligent history.

Are we in danger from an atrophy of these valuable senses? I am all for those devices designed to eliminate drudgery, but activity and effort must remain. Many of our modern machines are designed to eliminate individual effort, and therein may lurk a danger.

At first high hopes were held that in cortisone and ACTH we had the clue to the mechanism of many obscure diseases, and that they could provide sufferers with permanent relief. This prospect is fading rapidly; in fact, it would now appear that aspirin given in maximum tolerated doses is the best and safest treatment available for rheumatoid arthritis, the only common disease for which cortisone may reasonably be used. Apart from Addison's disease and hypopituitarism, in which these substances are rationally used as a form of replacement therapy, it cannot be claimed that cortisone and ACTH do more than suppress symptoms in a very expensive manner; and still we hear of wastage and expensive clinical experiments by those who like to "give anything a go".

It has been stated that in no community is adequate food more universally available than in Australia. Possibly in only one other country is more theory applied to man's essential needs in nourishment or more fuss and fad applied to infant dietary. But perhaps there may again be danger in our effortless acceptance of the dictate from a detached laboratory as to what should happen under certain conditions rather than what actually does occur. I am not sure what is the accepted relationship between diet and dental condition; but it is rather disquieting to find within a survey of nearly 25,000 that of every 100 eighteen-year-old otherwise healthy males accepted for national service 88 are dentally unfit—12 are actually wearing dentures (in one State 25), while three more require full and a further 22 partial dentures. In other words, to render each 100 of our eighteen-year-old males dentally fit, 37 dentures, complete or partial, are needed. This is appalling.

Similar danger arises from the ready and easy acceptance of the theory of others rather than the effort of a critical survey of our own clinical experiences.

Never for one moment would I suggest a return to the standard of medical practice at which the doctor was expected to possess, and actually claimed, the omniscience to cover all complaints and carry out all measures for their investigation and relief. Those were dark days. But in the blinding light of ever-narrowing specialization the practice of rationing a patient among the range of various investigators, rather than assuming more responsibility ourselves, is fraught with the grave danger of impersonality towards our patients and of the effortless ease of acting rather as a central registry than as a practitioner of medicine.

Above all, we face the danger of apathy and lack of true faith. We are "sitting too pretty", all is so easy, we "couldn't care less".

But here in Townsville today is an awareness of the danger of complacency; you realize that you can give an ever better service than you are giving to the community; you have here assembled medical men from the Commonwealth of Australia so that by deliberation and by demonstration there shall be advancement in this service that you are privileged to give.

No longer is the present considered to be the optimum; further and further must we push back the curtain that still veils our art. You have indeed ventured with courage beyond the safeties of the past, as did Robert Towns and those noble men and women here ninety years ago. You in your endeavours are pioneers as were they. God speed your venture in the commencement of what, I trust, will be an unending series of such gatherings; but let us always remember the prayer of Sir Francis Drake:

O God, may it be given to us to know that it is not the beginning but the carrying through to a successful issue that marks the worthiness of any endeavour.

## METHODS OF INCREASING ACCURACY IN RADON AND RADIUM IMPLANTS.

By K. W. MEAD,  
Queensland Radium Institute,

AND

K. A. STEVENS, B.Sc.,  
Physics Department, University of Queensland,  
Brisbane.

THE implantation of radium and radon sources has proved itself a most effective method of treatment for localized carcinoma in various sites. The scope of this

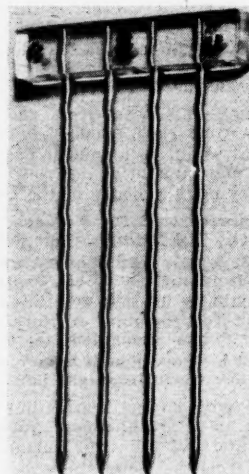


FIGURE I.  
Needles clamped in stabilizer.

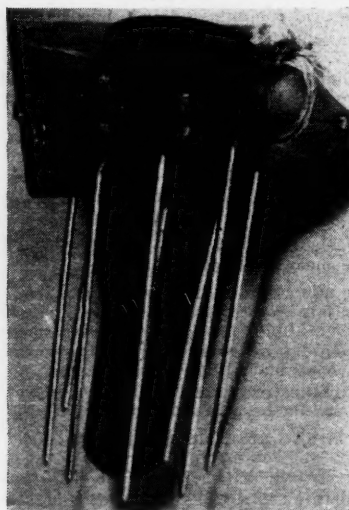


FIGURE II.  
Stabilizer used for anal implants.

method of radiotherapy could be extended and results improved if greater accuracy of implantation was possible in certain difficult sites, such as the tongue, mouth, larynx.

parotid gland, breast, anal canal, female urethra and vagina. For many years stabilizers have been used by Mr. A. Green, radiotherapist of the Royal Northern Hospital, London, and this paper describes their introduction at the Queensland Radium Institute. In connexion with

the halves of the rind to be implanted separately, so that the radiotherapist is able to guide the needles during implantation. These halves are then connected together by metal straps. The stabilizer is then sutured in position. The core radium is inserted by use of the bakelite cylinder, which is drilled to hold radium tubes. This is inserted

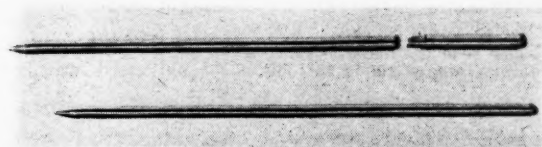


FIGURE III.  
Stainless steel radon needles.

stabilizers, a description is given of the use and construction of stainless steel needles in preference to gold needles. Where needles are too rigid seed chains are used, and their construction and method of implantation are described. The primary purpose of these methods is to increase accuracy, thereby minimizing the chance of under-

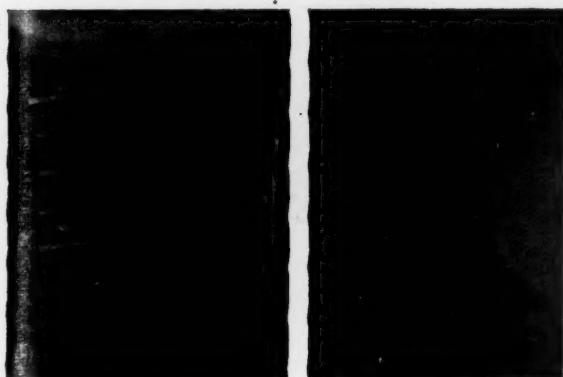


FIGURE IV.  
Post-operative single plane implant to parotid tumour.

dosage with resulting recurrence of tumour, and of overdosage and the sequel of radionecrosis.

#### Stabilizers.

The stabilizers for single-plane implants are constructed of quarter-inch "Perspex" sheet. They consist of two pieces of "Perspex", usually one centimetre wide, which are clamped together by brass screws. The "Perspex" stabilizer is drilled to hold the needles in what cannot be other than a geometrically perfect distribution. The holes for the needles are such that when the brass screws are tightened the needles are held rigidly (see Figure I).

The stabilizer remains in place during the full treatment time, being strapped by "Elastoplast" or sutured to the skin. The implant is performed in the usual manner, except that the needles are passed through the stabilizer, which thus acts as a guide for implantation. Since one centimetre of the needle is clamped in the stabilizer, it is necessary to have needles such that at least 1.5 centimetres of the eye-end are inactive. As crossing of the ends is difficult, the radon needles are differentially loaded at each end to simulate the end crossing.

Cylindrical volume implants of the anal canal have been regarded as technically difficult. For this reason, a stabilizer (Figure II) was constructed, consisting of three parts, two triangle-sectioned pieces of "Perspex", and a central core made of bakelite. The "Perspex" pieces allow

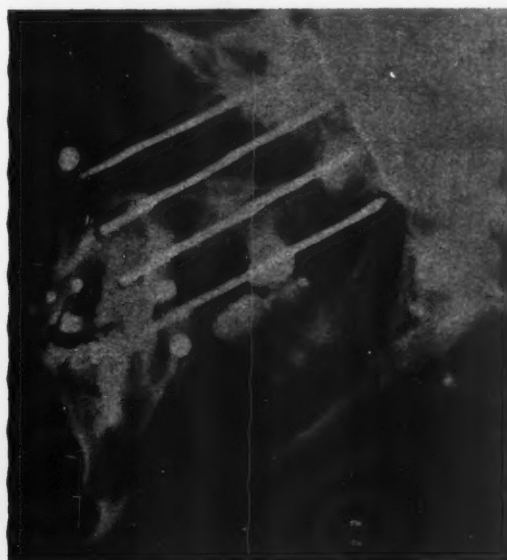


FIGURE V.  
Single plane steel radon needle implant to mucous and salivary gland tumour of buccal mucosa. Needles introduced from cutaneous surface.

through the "Perspex" block, and is held in position by brass screws which thread into the "Perspex" block. This central source is discontinuous, being used for short periods each day.

Originally these stabilizers were used with radon needles made from 0.8 millimetre wall gold tubing. However, it was found that, owing to the lack of mechanical strength,



FIGURE VI.  
Two-plane steel radon needle implant to upper cervical metastatic gland.

the geometrical pattern was spoilt by bending of the needles on implantation. For this reason, the use of stainless steel tubing, in preference to gold tubing, was decided on. These needles are shown in Figure III.



The tubing used is 13 gauge steel tubing with internal diameter of 1.7 millimetres. The point and eye are constructed of stainless rod, the point being then silver-

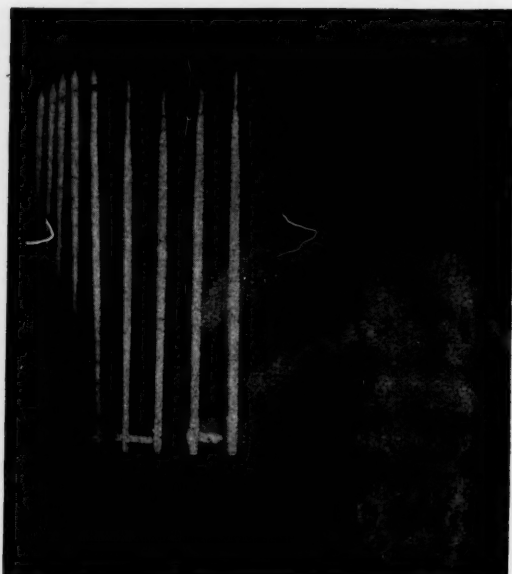


FIGURE VII.

Single curved plane steel needle implant to carcinoma situated in inframammary fold of breast.

soldered into position. The total inactive length of the point is 0.65 centimetre, 0.25 centimetre being the length of the thread. The total inactive length of the eye end is 1.75 centimetres, 0.25 centimetre being the thread. The length of the eye is to enable the stabilizer to clamp on to a solid portion, and gives the radiotherapist a solid

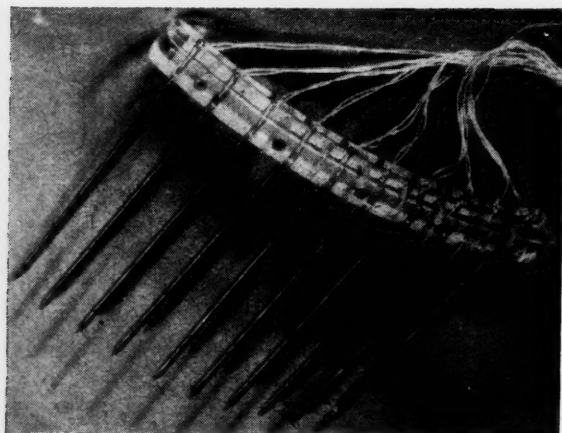


FIGURE VIII.

Photograph of stabilizer and needles used in the implant described in Figure VII.

section on which to clamp the forceps for insertion. The internal diameter of the tubing is such that 0.5 millimetre wall gold capillary tubing, in which the Radon Laboratory, University of Queensland, prepares most of the radon, fits freely. This enables needles to be prepared at short notice.

Figures IV to IX illustrate the use of stabilizers and steel needles for implants in various sites.

#### Seed Chains.

Seed chains seem to offer advantages over other sources of radiation for implantation of the tongue, lip and mouth, in that they can be introduced as accurately as needles, and more accurately than single seeds, and being flexible they are much more comfortable than needles. As they are removed at the completion of treatment, the fibrosis sometimes occurring around permanent radon seeds is not seen.

The seed chains are constructed of polyvinyl chloride tubing, into which is introduced 0.3 millimetre wall gold



FIGURE IX.

Cylinder volume implant to carcinoma of anal canal using gold radon needles and stabilizer with discontinuous central radium source as described.

capillary tubing. The tubing used is of a wall thickness of 0.2 millimetre and an internal diameter of 1.0 millimetre. Into this tubing the 0.3 millimetre wall gold capillary tubing fits freely, and to keep it in place, inactive lengths of 0.5 millimetre wall gold capillary tubing are introduced at either end. This is done by dilating the tubing by the use of acetone.

The method of introduction of the seed chains is as follows. A long, thin, steel rod with removable point (Figure X) is passed from before backwards through the tissue—for example, the tongue—so that it emerges behind the tumour. A tommy bar is passed through a small eye in the point of the rod, and the point is screwed off. A piece of brass rod, which has a thread at both ends, is threaded into the tubing. The introducing rod is then screwed into the small brass piece and the rod is withdrawn, followed by the seed chain which is then unscrewed and remains in the track made by the rod. To ensure greater accuracy, the rod for the next line is introduced parallel to the first one before the latter is withdrawn, and as many lines are used as are required for the volume being treated, and in appropriate distribution. The chains are tied together at both ends of the implant. They are end loaded to provide for crossing of the ends of the implant. The post-operative period is quite comfortable provided that the introducing rods are not too sharp, in which case hæmatoma of the tongue results. Tube shift X-ray reconstructions show that considerable accuracy is obtainable even when several planes are used.

The use of this method is illustrated by Figures XI and XII.

#### Summary.

This article describes the use of stabilizers and seed chains for implantation of radon and radium in the treat-



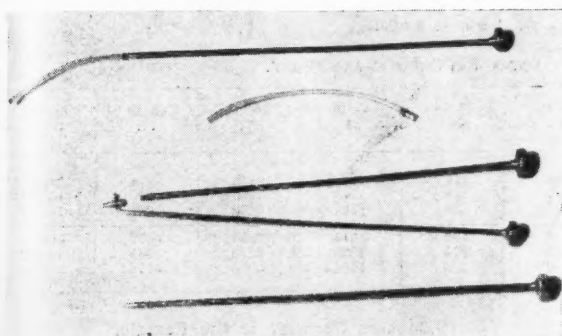


FIGURE X.  
Instruments for implanting seed chains.

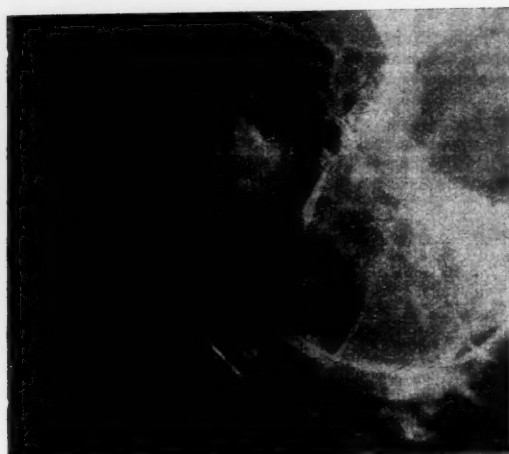


FIGURE XI.  
Single plane radon seed chain implant to carcinoma of lateral margin of tongue.

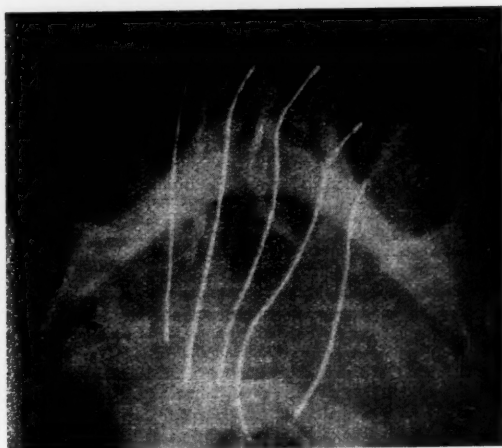


FIGURE XII.  
Single dorsal plane radon seed chain implant to extensive multifocal superficial carcinoma of dorsum of tongue.  
ment of cancer. The figures illustrate the increase in accuracy obtained by the use of such devices.

#### Acknowledgements.

We wish to thank the Director of the Queensland Radium Institute for permission to publish this report. Appreciation of help given is also expressed to Mr. N. Wells, clinical photographer of the Queensland Radium Institute, who carried out the photography, and to Mr. E. Harrold, of the workshop staff of the Physics Department, for his work on the construction of the steel needles and stabilizers.

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### THE MORTALITY IN AUSTRALIA FROM CANCER FOR THE PERIOD 1946 TO 1950.

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THE purpose of this paper is to give information on mortality from cancer in Australia for the years 1946 to 1950, thus bringing the series (Lancaster, 1950a, 1951, 1952, 1953, 1954a, 1954b and 1954c) up to the end of the latest completed five-year period. The increasing interest in lung cancer has led to a reconsideration of the death rates by the generation method. As in the previous papers, the deaths by age, sex and cause, as given in *Demography*, the annual bulletin of the Bureau of Census and Statistics, Canberra, are analysed.

The word "cancer" is being used in the sense of the second and fifth revisions of the "International List of Causes of Death"; that is, cancer means any malignant growth, whether carcinoma, sarcoma or melanoma. The leuchæmias and Hodgkin's disease are not, however, included.

For comparison, in this paper the rates for 1946 to 1950 are given together with the rates for 1931 to 1940, which was the last completed decennium and which, being unaffected by the war, enables comparisons to be made over the military ages. In some cases the rates for 1941 to 1945 are also given; and for the rarer tumours these two periods have been combined to form a single period, 1931 to 1945.

Throughout, all cancer death rates are given as deaths per million persons exposed *per annum*, the exposed and the deaths being of a given age group.

#### Total Cancer Mortality.

In Table I are given the death rates from cancer as a whole for the years 1946 to 1950. The rates in two previous periods are given for comparison. A slight fall in the rates is to be noted for males at ages fifty-five to seventy-four years, and for females at ages thirty-five to seventy-four years. These age-specific death rates form the most important measure of cancer mortality; but, for convenience, a single overall measure is often preferred. In Table II such overall measures are given. The most commonly used of these measures is the crude death rate. It is of little comparative value, as it tends to reflect changes in the age distribution of the population rather than changes in cancer mortality. Thus we notice an increase of some 10% for males and 15% for females in the crude death rates between the 1931 to 1940 and the 1946 to 1950 periods. Since there has actually been a general tendency for the rates to remain stationary or to fall, it is clear that these increases must be discounted as being due to aging. However, from an administrative point of view these increases are of importance, as they help to measure the extra burden which comes from aging of the population. The effect of aging can be eliminated by using a standard population. Here two standard populations have been used: first, the population of a million of either sex of the same age composition as the population of England and Wales in 1901, and secondly, the stationary

TABLE I.  
Death Rates from Cancer per Million per Annum in Australia.

Period.	Sex.	Deaths from Cancer at Ages (Years).							
		0 to 14.	15 to 24.	25 to 34.	35 to 44.	45 to 54.	55 to 64.	65 to 74.	75 and Over.
1931 to 1940 .. .. .	M.	24	41	98	316	1106	3445	8374	14,085
1941 to 1945 .. .. .	M.	28	35	92	278	1049	3160	7995	14,678
1946 to 1950 .. .. .	M.	36	51	107	306	1101	3286	7691	14,769
1931 to 1940 .. .. .	F.	21	33	130	596	1614	3253	6072	10,539
1941 to 1945 .. .. .	F.	26	39	139	574	1549	3170	6315	10,813
1946 to 1950 .. .. .	F.	27	38	140	550	1504	3056	5715	10,716

life table population constructed from the results of the Australian census of 1933. Their use has already been discussed (Lancaster, 1950). The standardized rates for the males have fallen slightly; those for the females show a larger fall. It is possible that the difference between the rates for the two sexes is to be accounted for by the increase in the lung cancer rates in males and the con-

#### Cancers Peculiar to the Female.

In Table IV are given the death rates from cancers peculiar to the female for the periods 1946 to 1950 and 1931 to 1940. Fuller comparisons may be made with the aid of Lancaster (1951).

#### Breast.

The death rates from cancer of the breast are approximately the same in 1946 to 1950 as they were in 1931 to 1940, except over age sixty-five years, where there are

TABLE II.  
The Crude and Standardized Death Rates from Cancer.

Period.	Sex.	The Crude Death Rate. <sup>1</sup>	The Rates Standardized on to the Population of England and Wales, 1901.	The Rates Standardized on to the Life Table Population of Australia, 1933 Census.
1931 to 1940 .. .. .	M.	1123 <sup>1</sup>	786 <sup>1</sup>	1825 <sup>1</sup>
1941 to 1945 .. .. .	M.	1180	755	1777
1946 to 1950 .. .. .	M.	1248	770	1784
1931 to 1940 .. .. .	F.	1069	831	1813
1941 to 1945 .. .. .	F.	1215	835	1833
1946 to 1950 .. .. .	F.	1224	798	1742

<sup>1</sup> Rates per million per annum.

tinued fall in the death rates from cancer of the uterus. The mortality from the cancers at individual sites will be analysed in later sections.

#### The Masculinity of the Cancer Death Rates.

In Table III comparisons can be made between the cancer death rates of the two sexes. As in a previous paper (Lancaster, 1950), the masculinity is defined as one hundred times the ratio of the male to the female rates. By this device the use of decimals is avoided. In 1946 to 1950 there is again a low masculinity over the younger ages, for which cancers of the ovary, breast and uterus are important causes of death, and cancers peculiar to the male are of relatively little importance.

TABLE III.  
The Male Cancer Rate Expressed as a Percentage of the Female Cancer Mortality Rate (Masculinity).

Age Group. (Years.)	Masculinity, 1931 to 1940.	Masculinity, 1946 to 1950.
25 to 34 .. .. .	75	76
35 to 44 .. .. .	53	56
45 to 54 .. .. .	69	73
55 to 64 .. .. .	106	108
65 to 74 .. .. .	138	135
75 and over .. .. .	134	138

some increases. There had been increases over the years 1908 to 1945. So it may be that this movement in the rates is nearing its end.

#### Uterus.

The death rates from cancer of the uterus had been falling before 1945 and this fall has continued into 1946 to 1950.

#### Ovary.

Cancer of the ovary had been increasing in importance over the years 1908 to 1945, and these increases have continued into the latest period, 1946 to 1950. Similar increases have been noted by the Registrar-General of England and Wales in his annual reports.

#### Vagina and Vulva.

The rates from cancer of these two sites appear to be stationary. Since the numbers involved have not been

TABLE IV.  
The Mortality in the Years 1946 to 1950 from Cancers Peculiar to the Female.

Site of Cancer.	Period.	Deaths per Million <i>per Annum</i> at Ages (Years).						
		15 to 24.	25 to 34.	35 to 44.	45 to 54.	55 to 64.	65 to 74.	75 and Over.
Breast .. .. .	1931 to 1940.	0	24	170	431	701	915	1424
	1946 to 1950.	1	29	160	436	688	1021	1621
Uterus .. .. .	1931 to 1940.	1	25	142	339	528	688	875
	1946 to 1950.	4	22	101	281	465	640	762
Ovary .. .. .	1931 to 1945.	3	14	45	129	177	193	185
	1946 to 1950.	5	12	50	145	203	245	218
Vagina .. .. .	1931 to 1945.	0	0	2	4	12	21	37
	1946 to 1950.	0	0	2	2	4	12	28
Vulva .. .. .	1931 to 1945.	0	0	0	7	17	53	116
	1946 to 1950.	0	0	2	4	13	30	90
Unspecified genital .. .. .	1946 to 1950.	0	0	1	2	6	20	39

TABLE V.  
The Mortality from Cancers Peculiar to the Male in the Years 1946 to 1950, in Australia.

Site of Cancer.	Period.	Deaths per Million per Annum at Ages (Years).						
		25 to 34.	35 to 44.	45 to 54.	55 to 64.	65 to 74.	75 and Over.	All Ages.
Breast .. .. .	1931 to 1945.	0	1	2	3	15	26	2
	1946 to 1950.	0	0	0	6	10	34	2
Prostate .. .. .	1931 to 1940.	0	4	24	226	1000	2146	108
	1946 to 1950.	0	2	25	218	951	2799	137
Testis .. .. .	1931 to 1945.	9	8	6	10	17	31	6
	1946 to 1950.	13	11	9	7	9	31	8
Penis and scrotum ..	1931 to 1945.	0	2	4	13	31	85	5
	1946 to 1950.	0	2	4	9	22	63	4

TABLE VI.  
The Mortality in Australia from Cancers of the Buccal Cavity for the Years 1946 to 1950.

Site of Cancer.	Sex.	Deaths per Million per Annum at Ages (Years).						
		25 to 34.	35 to 44.	45 to 54.	55 to 64.	65 to 74.	75 and Over.	All Ages.
Lip .. .. .	M.	2	1	8	13	44	219	10
Mouth .. .. .	M.	0	0	9	23	62	165	10
Tongue .. .. .	M.	1	2	12	54	123	315	20
Pharynx and tonsil ..	M.	2	2	16	33	99	199	15
Mouth (unspecified) ..	M.	0	1	3	6	13	38	3
Total (buccal cavity) ..	M.	5	7	47	129	341	936	58
Buccal cavity (1931 to 1940)	M.	(4)	(16)	(70)	(301)	(794)	(1446)	(99)
Lip .. .. .	F.	0	0	0	1	3	23	1
Mouth .. .. .	F.	0	0	0	4	13	26	2
Tongue .. .. .	F.	0	0	3	9	14	42	3
Pharynx and tonsil ..	F.	0	2	5	11	25	28	4
Mouth (unspecified) ..	F.	0	0	0	1	4	12	1
Total (buccal cavity) ..	F.	0	2	8	26	59	131	11
Buccal cavity (1931 to 1940)	F.	(1)	(5)	(13)	(39)	(84)	(212)	(14)

TABLE VII.  
The Mortality in Australia from Cancers of the Alimentary System for the Years 1946 to 1950.

Site of Cancer.	Sex.	Period.	Deaths per Million per Annum at Ages (Years).						
			25 to 34.	35 to 44.	45 to 54.	55 to 64.	65 to 74.	75 and Over.	All Ages.
Esophagus .. .. .	M.	1931 to 1940.	1	5	39	179	428	605	51
		1946 to 1950.	2	4	22	115	297	628	44
Stomach .. .. .	M.	1931 to 1940.	11	77	341	1059	2603	3679	325
		1946 to 1950.	9	55	234	772	2093	3418	294
Small intestine .. ..	M.	1946 to 1950.	1	2	4	10	22	36	4
Intestines, colon .. ..	M.	1931 to 1940.	15	44	138	404	975	1693	135
		1946 to 1950.	11	38	120	355	914	1954	149
Rectum .. .. .	M.	1931 to 1940.	5	20	68	201	434	683	61
		1946 to 1950.	7	21	53	187	491	827	72
Liver .. .. .	M.	1931 to 1940.	3	10	46	135	322	532	43
		1946 to 1950.	3	10	33	109	247	382	38
Pancreas .. .. .	M.	1931 to 1940.	2	15	51	151	282	390	40
		1946 to 1950.	2	17	56	169	347	552	56
Peritoneum .. .. .	M.	1946 to 1950.	3	7	9	23	33	20	8
Esophagus .. .. .	F.	1931 to 1940.	0	5	19	48	117	189	16
		1946 to 1950.	1	2	11	34	100	206	17
Stomach .. .. .	F.	1931 to 1940.	9	47	168	487	1348	2483	184
		1946 to 1950.	6	40	108	363	1050	2320	183
Small intestine .. ..	F.	1946 to 1950.	0	2	2	9	17	23	3
Intestines, colon .. ..	F.	1931 to 1940.	13	62	164	423	1063	2077	159
		1946 to 1950.	21	54	145	406	898	2081	181
Rectum .. .. .	F.	1931 to 1940.	5	21	70	138	246	407	43
		1946 to 1950.	5	17	49	132	276	524	53
Liver .. .. .	F.	1931 to 1940.	3	18	51	177	385	670	56
		1946 to 1950.	3	13	45	118	251	477	48
Pancreas .. .. .	F.	1931 to 1940.	2	8	34	112	230	315	32
		1946 to 1950.	1	9	38	105	250	466	45
Peritoneum .. .. .	F.	1946 to 1950.	1	4	13	19	33	32	7

great, they give rather less satisfactory comparisons than the other cancers. Previously (Lancaster, 1951) it was felt that the deaths needed to be combined over a longer period for accurate comparisons to be made.

#### Cancers Peculiar to the Male.

In Table V are given the death rates from the cancers peculiar to the male, among which are included for convenience cancer of the male breast. The rates given for

TABLE VIII.  
The Mortality in Australia from Certain Cancers for the Years 1946 to 1950.

Site of Cancer.	Sex.	Period.	Deaths per Million per Annum at Ages (Years).						
			25 to 34.	35 to 44.	45 to 54.	55 to 64.	65 to 74.	75 and Over.	All Ages.
Larynx .. .. .	M.	1931 to 1940.	1	5	27	99	192	271	26
		1946 to 1950.	1	3	18	72	150	255	23
Bronchus and lung ..	M.	1931 to 1940.	—	33	85	203	234	208	47
		1946 to 1950.	7	36	211	547	692	509	129
Bladder .. .. .	M.	1931 to 1940.	1	5	35	101	276	528	36
		1946 to 1950.	2	8	37	130	295	585	46
Kidney .. .. .	M.	1931 to 1940.	3	9	29	51	89	91	16
		1946 to 1950.	3	7	35	80	111	121	23
Skin .. .. .	M.	1931 to 1940.	6	13	35	84	252	970	43
		1946 to 1950.	13	18	36	80	177	809	45
Brain and nervous system	M.	1946 to 1950.	8	16	36	46	24	7	17
Bones .. .. .	M.	1946 to 1950.	4	10	13	35	93	170	18
Thyroid gland .. ..	M.	1946 to 1950.	4	2	8	8	21	22	4
Miscellaneous .. ..	M.	1946 to 1950.	13	30	90	178	326	621	68
Larynx .. .. .	F.	1931 to 1940.	0	2	4	18	21	39	4
		1946 to 1950.	0	0	3	11	21	44	4
Bronchus and lung ..	F.	1931 to 1940.	—	13	39	74	106	103	21
		1946 to 1950.	7	18	48	107	155	171	34
Bladder .. .. .	F.	1931 to 1940.	0	3	12	45	119	212	16
		1946 to 1950.	1	2	11	40	113	238	19
Kidney .. .. .	F.	1931 to 1940.	2	5	19	29	60	87	12
		1946 to 1950.	2	3	19	43	77	100	16
Skin .. .. .	F.	1931 to 1940.	2	5	11	38	116	599	24
		1946 to 1950.	11	15	19	37	76	443	27
Brain and nervous system	F.	1946 to 1950.	4	13	22	28	20	7	12
Bones .. .. .	F.	1946 to 1950.	3	6	14	24	41	113	12
Thyroid gland .. ..	F.	1946 to 1950.	0	3	7	19	55	67	8
Miscellaneous .. ..	F.	1946 to 1950.	11	31	70	154	251	500	61

TABLE IX.  
The Mortality Rates from Cancer of the Lung in Australia.<sup>1</sup>

Age. (Years.)	Deaths per Million per Annum.							
	Males Born About				Females Born About			
	1870.	1880.	1890.	1900.	1870.	1880.	1890.	1900.
30 to 34 .. .. .	— <sup>2</sup>	8	5	12	— <sup>2</sup>	6	5	8
35 to 39 .. .. .	5	9	8	17	10	13	10	6
40 to 44 .. .. .	9	16	45	49 <sup>3</sup>	18	21	14	20
45 to 49 .. .. .	23	20	69	144	27	17	34	33
50 to 54 .. .. .	31	88	183	370	35	36	44	67
55 to 59 .. .. .	79	222	441	—	45	61	92	—
60 to 64 .. .. .	160	356	843	—	82	90	114	—
65 to 69 .. .. .	280	728	—	—	129	141	—	—
70 to 74 .. .. .	338	1099	—	—	126	201	—	—
75 and over .. ..	456	—	—	—	153	—	—	—

<sup>1</sup> Unless otherwise specified, dashes indicate that this experience has not yet come within the scope of the table.

<sup>2</sup> Rates not available.

<sup>3</sup> Affected by wartime statistical practices of excluding deaths of military personnel.

1946 to 1950 are compared with those from Lancaster (1952).

#### Breast.

This is a relatively unimportant site of cancer in the male. Since the numbers of deaths involved are small, the rates have a considerable sampling of error, but it seems fair to regard the rates from this site as stationary.

#### Prostate.

There has been a slight increase in the rates at ages 75 and over in 1946 to 1950, but otherwise the rates are approximately equal to those in 1931 to 1940.

#### Testis.

This is a relatively unimportant site. The death rates have an unusual age distribution, not greatly changing with age as do all the other cancers.

#### Penis and Scrotum.

This is also an unimportant site numerically. The rates from cancer of the testis and of the penis and scrotum show no definite change from those in 1931 to 1945.

#### Cancers of the Alimentary Tract.

The death rates from the cancers of the alimentary tract are given in Tables VI and VII.

#### Buccal Cavity.

For reasons detailed by Lancaster (1954b) there is great difficulty in giving comparisons of the individual sites over the years 1908 to 1945. However, it is certain that there had been a great improvement in this group considered as a whole, and this improvement has continued into the period 1946 to 1950.

#### Esophagus.

The death rates from cancer of this site had been falling before 1945 and the falls have continued.

#### Stomach and Duodenum.

Here again there had been falls before 1945 and these falls have continued into the latest period.



*Small Intestine.*

Under this heading in Table VII are included all the cancers of the small intestine except the cancer of the duodenum. This is an unimportant site numerically.

*Colon.*

There is no obvious trend in the mortality from cancers of the colon. These may be safely compared with figures for cancers of the intestines previously published by Lancaster (1954b), which combined cancers of the small and large intestines. At the younger ages there appears to be a very slight fall and at the older ages a definite but small rise.

*Rectum.*

A similar change appears to have taken place with these cancers—a very slight decline at the younger ages and an increase at the higher ages.

*Liver.*

The falls already noted before 1945 in mortality from cancer of the liver have continued. Whether the falls are due to a change in incidence or whether they reflect a true change is difficult to answer.

*Pancreas.*

The death rates from cancer of the pancreas had been increasing up to 1945 (Lancaster, 1954a). Since then little change has occurred.

*Cancer of the Respiratory System.**Larynx.*

There had been a general decline in the death rates in males from cancer of the larynx before 1945, and this decline has continued. The rates for females had been stationary and have remained so into the last period.

*Bronchus and Lung.*

Deaths from cancer of the lung continue to increase at all ages, especially in males. A notable feature of the rates for this site is the lower rates for males over seventy-five years as compared with the rates at ages sixty-five to seventy-four years.

Following Kennaway and Waller (1953), or Nielsen and Clemmensen (1954), an analysis may be made by the generation method. For any given cohort the rates continue to increase throughout life. In diseases of long standing, at a time of changing death rate the maximum age by the calendar method often differs from that experienced in any one cohort or "generation" of persons. If the rates are increasing, the maximum will be displaced towards the younger age groups; if the rates are decreasing, the maximum will be displaced towards the older age groups, as in tuberculosis (Lancaster, 1950b). In any one cohort it will be seen that the death rates from cancer of the lung are increasing steadily throughout life, whereas by the calendar method there is a maximum in the age group sixty-five to seventy-four years for males, in both periods in Table VIII. If one accepts the view that a generation with a high initial mortality will have a high mortality throughout its life, it is evident that there will be great increases in lung cancer in the near future.

*Other Cancers.*

In Table VIII are given the death rates from cancers of some less important sites: bladder, kidney, brain and nervous system, bones, thyroid and miscellaneous sites.

*Summary.*

The paper itself is a summary of the vital statistics on cancer. There have been some improvements in the death rates from cancers at all ages. There have been steady increases in the death rates from cancers of the lung, especially in males. Of the common cancers this is the only important rise. Of the cancers showing definite trends, improvements are noted for uterus, buccal cavity, oesophagus, stomach, liver and larynx. Previous upward trends in the death rates reported for the ovary and breast appear to have ended.

*Acknowledgements.*

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# SOME EFFECTS OF RADIATION ON LYMPHOID CELLS: PART II.

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*Previous Work.*

It has been shown (Shiels, 1954) that the ratio of monocytes *plus* large lymphocytes to small lymphocytes,  $\frac{L + M}{S}$ , and the percentage of lymphocytes which have granules in the cytoplasm, are both significantly different, in a group of persons who are exposed to radiation, from the values in another group of persons not exposed to any radiation.

*Present Investigation.*

This investigation records the results obtained for six persons prior to and after some months' exposure to radiation for the two factors mentioned above, and also for the ratio of large to small lymphocytes, and for the percentage of monocytes which were of a particular type (designated "B" type). The appearance of this type of monocyte will be discussed later on in this paper.

It shows that for a group of persons not exposed to radiation or to any agents which have been shown to cause changes in the findings, the values were not significantly different at a certain time from what they were some months later.

The technique used in the examination of the blood films was the same as that described in the previous paper (Shiels, 1954).

Of the six persons in the group which was exposed to radiation, three had a history of past exposure to radiation for some years, but had been away from any such exposure prior to the commencement of these tests for periods of twelve, fifteen and three and a half months. The other three were younger persons who had no history of exposure to radiation prior to the commencement of the period under review.

The persons considered in the exposed group were engaged, some in a mass X-ray survey, and some as assistants in a cancer clinic, their work involving some exposure to X ray or radiations from radioactive substances.

TABLE I.  
Exposed Group.

Subject.	Ratio of Monocytes plus Large Lymphocytes to Small Lymphocytes.		Ratio of Large to Small Lymphocytes.		Percentage of Lymphocytes with Granules in Cytoplasm.		Percentage of Monocytes of Particular Type.	
	Prior to Exposure.	After Exposure from Four to Seven Months.	Prior to Exposure.	After Exposure from Four to Seven Months.	Prior to Exposure.	After Exposure from Four to Seven Months.	Prior to Exposure.	After Exposure from Four to Seven Months.
81	1.97	2.18	1.42	1.34	45.31	18.92	34.6	46.8
82	2.39	3.14	1.76	2.10	51.4	40.3	50.0	67.5
83	1.37	2.66	1.1	2.28	50.88	26.47	46.66	72.2
B	2.45	5.16	1.73	3.91	50.0	38.6	29.16	66.66
Gu	2.3	4.68	1.8	3.14	76.47	41.30	27.27	32.35
Gr	2.17	5.0	1.45	3.7	50.0	33.3	21.21	66.66
Mean .. ..	2.11	3.80	1.54	2.74	54.01	33.15	33.97	58.7

The degree of exposure was very probably not high. Actual measures of the exposures were not available for these six persons; but a number of others working in the same institutions had exposures at relevant times which were of the order of 10% to 20% of the permissible dose (0.3r per week, free air dose).

#### Results Prior to Exposure and After Six Months' Exposure.

Table I shows the values found for the exposed group, and Table III the results of statistical analysis of the differences between the values obtained from the tests performed before and after exposure. For Table III, for the exposed group, the absolute differences in the values before and after exposure and also the differences expressed as percentages of the respective preexposure values have been analysed.

For exposed persons the results of this analysis indicate a significant increase in both ratios, a significant decrease in the percentage of lymphocytes with granules in the cytoplasm, and a significant increase in the percentage of the monocytes which were of the particular type, at the second examination as compared with the values obtained at the first examination.

#### Results of Tests on Unexposed Persons Before and After a Period of Some Months.

The blood films of seven persons who had no exposure to radiation or to other influences known to cause changes in the factors investigated were examined at a certain time and again some months later. The results are recorded in Table II.

The differences between the findings at the two examinations were not significant, the results of statistical analysis of the findings being shown in Table III.

#### Comparison of Results.

In Table IV are recorded the changes in the results of the different tests. For the exposed group the changes are between the values prior to exposure and those found after four to seven months' exposure. For the unexposed groups the changes are between the values found at a certain time and those found more than seven months later. In all cases the changes are expressed as percentages of the original values. The results of statistical analysis of these changes are shown in Table III.

For the exposed group the differences between values found at the second examination and at the first were statistically significant for all four tests, whereas for the unexposed group the differences were not significant for any of the four tests.

A comparison has been made between the results of the tests for unexposed and for exposed persons from the point of view of the direction and magnitude of the changes in the values at the different examinations. For the exposed persons the tests compared were those before and those subsequent to exposure. For the unexposed persons the tests compared were those performed at a certain time and those performed some months later. Table V shows the results.

For the exposed persons, four tests each were made on each of six persons—that is, 24 tests in all.

For the unexposed persons four tests each were made on each of seven persons—that is, 28 tests in all.

It has previously been shown (Shiels, 1954) that in normal blood it is the larger lymphocytes of which the greater percentage has granules in the cytoplasm. Although the ratio of monocytes plus large lymphocytes to small lymphocytes was greater in a large group of persons exposed to radiation than in a large group of persons not so exposed, the percentage of lymphocytes with granules

TABLE II.  
Group Not Exposed.

Subject.	Ratio of Monocytes plus Large Lymphocytes to Small Lymphocytes.		Ratio of Large to Small Lymphocytes.		Percentage of Lymphocytes with Granules in Cytoplasm.		Percentage of Monocytes of the Particular Type.	
	First Test.	Second Test.	First Test.	Second Test.	First Test.	Second Test.	First Test.	Second Test.
J	1.92	1.84	1.44	1.26	37.5	59.6	23.08	27.6
M	2.28	4.2	1.47	2.24	32.8	16.0	38.23	42.86
F	3.45	4.0	2.55	2.62	50.0	60.4	71.4	35.0
M	2.35	2.56	1.70	1.70	29.0	51.8	57.14	19.33
MeO	1.85	2.51	1.47	1.53	66.6	62.7	45.8	27.27
K	4.1	3.4	3.38	2.27	47.1	63.6	42.8	38.24
W	2.44	3.1	1.34	2.06	35.42	61.0	65.7	21.05
Mean .. ..	2.62	3.09	1.907	1.95	42.63	53.6	49.02	30.20

TABLE III.

Group.	Ratio of Monocytes plus Large Lymphocytes to Small Lymphocytes.		Ratio of Large to Small Lymphocytes.		Percentage of Lymphocytes Showing Granules in Cytoplasm.		Percentage of Monocytes of the Particular Type.	
	For Absolute Change in Value.	For Change as Percentage of Original Value.	For Absolute Change in Value.	For Change as Percentage of Original Value.	For Absolute Change in Value.	For Change as Percentage of Original Value.	For Absolute Change in Value.	For Change as Percentage of Original Value.
Exposed :								
<i>t</i> .. ..	3.78	4.08	3.12	3.1	5.645	6.357	3.807	3.882
<i>P</i> .. ..	0.012 Significant increase.	0.0098 Significant increase.	0.0275 Significant increase.	0.0275 Significant increase.	0.0038 Significant increase.	0.002 Significant increase.	0.012 Significant increase.	0.011 Significant increase.
Unexposed :								
<i>t</i> .. ..	1.505	1.74	0.2	0.8	1.83	1.71	2.41	2.16
<i>P</i> .. ..	<0.2 >0.1 No significant change.	<0.2 >0.1 No significant change.	<0.9 >0.8 No significant change.	<0.4 >0.3 No significant change.	<0.20 >0.10 No significant change.	<0.2 >0.1 No significant change.	>0.05 <0.10 No significant change.	<0.10 >0.05 No significant change.

in the cytoplasm was significantly smaller in the former group than in the latter. It appeared that the greater value in the exposed group for the ratio of monocytes plus large lymphocytes to small lymphocytes was not entirely due to an increase in the relative number of monocytes, but that there was also an increase in the relative number of large lymphocytes. However, at that stage this was not conclusively proved.

The results recorded in this paper show that after a period of several months' exposure to ionizing radiation

exposure was 6.267. For  $n=5$ , this corresponds to  $P < 0.0028$ .

For the unexposed group the  $t$  value for the significance of the mean change between the first findings and the findings some months later was 1.147. For  $n=6$ , this corresponds to a  $P$  value less than 0.3 (near to 0.3), and greater than 0.2, which is not significant.

The results so far recorded leave little doubt as to the reality of the effects of the minor degrees of radiation to which the subjects were exposed.

TABLE IV.

Subject.	Ratio L+M. S	Ratio L:S.	Percentage of Lymphocytes with Granules in Cytoplasm.	Percentage of Monocytes of "B" Type.
Exposed group :				
B .. ..	+110.3	+136.0	-22.8	+128.6
Gu .. ..	+103.5	+74.4	-46.0	+186.2
Gr .. ..	+130.4	+155.0	-33.4	+214.0
W .. ..	+94.15	+107.0	-47.73	+73.34
P .. ..	+31.38	+20.0	-21.60	+35.00
Pr .. ..	+10.7	-5.7	-58.24	+35.26
Mean .. ..	+80.07	+81.1	-38.3	+112.07
Unexposed group :				
J .. ..	-4.16	-12.5	+58.93	+19.58
M .. ..	+84.2	+52.38	-50.11	+12.11
F .. ..	+15.44	+2.75	+20.80	-50.98
H .. ..	+8.93	+0.0	+78.6	-66.16
Mc .. ..	+35.67	+4.08	-5.8	-40.45
K .. ..	-17.07	-32.8	+35.04	-10.65
W .. ..	+27.50	+53.7	+72.10	-67.96
Mean .. ..	+21.57	+9.66	+29.93	-29.20

there is an increase in the ratio of large lymphocytes alone to small lymphocytes. Therefore, since there is an increase in the relative number of large lymphocytes, and since instead of a concomitant increase in the percentage of lymphocytes with granules in the cytoplasm, as might have been expected, there is a decrease, it appeared reasonable to combine these two factors into a single factor, as follows:

Percentage of lymphocytes showing granules in the cytoplasm  
L:S

When this is done, there is a very striking difference between the changes in this combined factor for the exposed group between the pre-exposure and post-exposure values, and the absence of change for the unexposed group between the two examinations carried out at intervals of several months.

For the exposed group the  $t$  value for the significance of the mean change in this factor between the pre-exposure findings and the findings after four to seven months'

TABLE V.

Tests.	Exposed Group.	Unexposed Group.
Tests showing change greater than 10% in the appropriate direction ..	23	7
Tests showing change greater than 40% in the appropriate direction ..	15	4
Tests showing change greater than 70% in the appropriate direction ..	12	1
Tests showing changes greater than 10% in any direction ..	23	21
Tests showing changes greater than 40% in any direction ..	15	11
Tests showing changes greater than 70% in any direction ..	12	3

#### Comparative Effects of Exposure on Persons New to Exposure and on Persons Who Had a History of Previous Exposure.

A comparison has been made between the changes in the findings before and after exposure for the three persons who had a history of previous exposure followed by an interval away from it, and for the three younger persons for whom the exposure was their first.

Although the numbers compared were very small, there appeared to be some evidence that the reexposure to radiation for four to seven months of persons who had a history of some years' exposure followed by a period of some months away from it had a greater effect than the same period of exposure had on persons who were experiencing radiation for the first time. However, the numbers compared were too small to justify any firm conclusions.

The difference in the effects observed may have been due to the ages of the two groups, or it may have been that the members of the younger group, being inexperienced persons, were given less responsible work which involved less exposure to radiation.

It should be worth while investigating this matter further.

*Effect on Monocytes.*—Browning (1949) has described the presence of abnormal cells in the stained blood films of persons engaged in luminizing with radioactive material.



The most characteristic of the abnormal cells were large mononuclear cells of immature type. These occurred in about 9% of all cases each year. The abnormal monocytes occurred in the same film as large mononuclear cells of perfectly normal appearance, constituting 30% to 60% of all large mononuclear cells present. No abnormal cells were observed in any of the controls. The "abnormal" mononuclear cells were of the following two kinds:

1. A "lymphoidocytic" type. This corresponded closely to the type of young monocyte described by Tzanck, Dreyfus and Bessis (1944), as follows: size  $15\mu$  to  $30\mu$ , nucleus of "combed" appearance, regular, with no dense masses of chromatin. The nucleus may be round, oval or bent at several points, rectangular or trapezoid; it may be free in the cytoplasm or adherent at one point to the periphery by a wide pedicle sometimes cutting the cytoplasm in two parts. The cytoplasm is weakly basophile, hyaline, sometimes polychromatic, the edges are clear and sometimes more deeply stained than the rest, and occasionally showing azurophile granules. The cell is difficult to distinguish from a large lymphocyte.

2. A large "granular" type. The characteristic features of this large cell ( $18\mu$  to  $25\mu$  in diameter), when stained by Wright's or Leishman's stain, are a ragged spreading dense nucleus and heavy granulation of the cytoplasm.

The type of monocytes which I have designated "B" type resembled closely the "lymphoidocytic" type described by Tzanck *et alii* (1944). Browning (1949) refers to these cells as "abnormal", and states that none of the "abnormal" cells were observed in any of the controls. The monocytes which I have described as "B" type were large ( $15\mu$  to  $25\mu$ ). The nucleus, which tended to have the "combed" appearance described by Tzanck *et alii* (1944), was usually bent into the form of a thick B or S shape, or was almost rectangular or trapezoid. It sometimes reached from side to side of the cell, there being relatively little cytoplasm.

The monocytes were divided for the purposes of this investigation into the type with rounded or oval nuclei, those with crescentic or reniform nuclei, and the type described above. The classification was admittedly somewhat arbitrary, as there appeared to be a gradation from one type to another, the structural differences sometimes making it difficult to classify a particular cell into one category or another.

In normal blood films some cells which had to be classed as of "B" type, by the somewhat arbitrary criteria indicated above, were always present, but were less definitely characteristic than in the films of exposed persons.

Possibly the difficulty in definitely classifying the cells into their different types accounts for the differences between the findings of Browning (1949) and those recorded in this paper.

#### Summary.

1. It has been shown for a group of six persons examined prior to and after four to seven months' exposure to minor amounts of ionizing radiations that there were significant increases at the second examination above the values at the first in the following: the ratios of monocytes *plus* large lymphocytes to small lymphocytes, the ratios of large to small lymphocytes, and the percentages of the monocytes which were of a particular type; there was also a significant decrease in the percentage of lymphocytes with granules in the cytoplasm.

2. In a control group of seven persons not exposed to ionizing radiation or to other causes known to produce changes in the test results, who were examined at a certain time and again some months later, there were no significant changes in any of the test results at the latter time.

#### Acknowledgements.

Acknowledgements are made to Mrs. W. Van den Berg, of the Industrial Hygiene Division Laboratory, for the preparation of uniformly satisfactory blood films, and to Miss A. Doig, of the Department of Mathematical Statistics of the University of Melbourne, for advice as to

statistical analysis, the results of which are set out in Table III.

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#### SPONTANEOUS DISAPPEARANCE OF TUBERCULOMATA OF THE LUNG.

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ALTHOUGH several authors have described their gradual resolution, there have been few descriptions of the relatively sudden and harmless disappearance of pulmonary tuberculomata of long-standing stability. One case was mentioned by Brown (1949). However, this phenomenon has been observed sufficiently frequently during the follow-up investigation of tuberculous patients to warrant the conclusion that the disappearance was an important aspect of the natural history of tuberculomata.

For various reasons it is postulated that the tuberculomata were evacuated rather than absorbed. The phenomenon was generally quite harmless and unassociated with any evidence of active disease.

#### Clinical Material.

Amongst some 2000 tuberculous patients, predominantly males, attached to the Chest Clinic for out-patient observation, eight were discovered in whom a tuberculoma had disappeared suddenly. The total number of patients with a tuberculoma was not ascertained.

A tuberculoma was defined as a rounded or semi-rounded lesion at least one centimetre in diameter, having a defined margin and considered to be tuberculous on bacteriological or radiological grounds.

As there are considerable differences of opinion concerning the treatment of tuberculomata, it is of some importance to investigate their seemingly harmless termination and to detect factors associated with such a course.

The eight cases have been studied from this aspect, and the patients were followed subsequently for between nine months and four years.

#### Analysis of Cases.

The eight patients were males, aged between twenty-nine and fifty-one years at the time of the disappearance of the lesion. Tuberculosis was diagnosed on bacteriological grounds in six and radiologically in two. In one case disease of moderate extent, and in another extensive disease was present. The tuberculomata were all one to two centimetres in size. The majority were situated in the upper zones of the lungs.

Four of the tuberculomata were present when the patient first came under observation; in three cases the tuberculoma developed from a larger ill-defined patch of infiltration. Transient cavitation developed in three of the tuberculomata at some stage. Except for one patient, who was allowed to continue his occupation, treatment consisted of the sanatorium routine, which was combined with chemotherapy in one case and artificial pneumothorax in two cases.

The tuberculomata had been observed for one and a half to eight years before their disappearance.

In the X-ray film taken prior to their disappearance, four of the tuberculomata were found to have enlarged slightly, and two had become a little smaller. Apart from these slight changes, the tuberculomata in all but one case had been inactive for a prolonged period, and in four



instances partial calcification had appeared prior to their disappearance.

The disappearance of the lesions was not marked by any additional symptoms except in Case I; this patient had "influenza". Seven patients were well and working, and the eighth was in hospital convalescing from segmental resection of the lung.

When the disappearance of the lesion was discovered, only insignificant X-ray markings remained in six cases; in two cases a tiny thin-walled space was seen, which later closed. There was no evidence of spread of the disease in any patient, and bacteriological investigations likewise gave negative results.

None of the patients received any special treatment; seven remained working; the eighth, who was in hospital, has since returned home.

During the subsequent observation period, one of the patients developed a recurrence at the site of the original tuberculoma. In another case, activity apparently unrelated to the original tuberculoma developed in the opposite lung, and the results of examination of laryngeal swabs became positive. These two patients have now commenced further treatment. In the remaining six cases bacteriological investigations have consistently given negative results, and there has been no radiologically evident deterioration.

The single patient showing recurrence of activity attributable to the original tuberculoma had had activity in the lesion much more recently than the other patients, if the slight changes in the size of the tuberculoma prior to its evacuation are excluded.

#### Reports of Cases.

**CASE I.**—A male patient, aged thirty-four years, was admitted to hospital in January, 1947, with respiratory tract symptoms. His sputum contained tubercle bacilli. An X-ray examination of the chest revealed an ill-defined area of infiltration in the left upper zone with suspected cavitation. Part of the infiltrated area soon became better defined, forming a tuberculoma one centimetre in diameter. After the patient had been given preliminary bed rest a left artificial pneumothorax was successfully induced and provided satisfactory relaxation after pneumonolysis. His sputum became free from tubercle bacilli, and he was discharged home in April, 1949. The pneumothorax was continued for just over three years.

The tuberculoma remained little changed until March, 1952, when it appeared a little larger. In September, 1952, the patient had a respiratory tract infection resembling influenza, which lasted for several days. He was radiologically examined and it was found that the tuberculoma had disappeared. Attempts at culture from the gastric contents gave negative results. Apart from some cough and sputum, the patient has remained well and has continued full work.

In July, 1954, he had slight blood-staining of the sputum. His sputum has remained free from acid-fast bacilli, and no further radiological change has occurred. When he was examined two years after the disappearance of the tuberculoma, his condition was satisfactory.

**CASE II.**—A male patient, aged twenty-three years, had a routine X-ray examination of his chest in October, 1945. This revealed a tuberculoma about two centimetres in diameter containing a central translucent area, situated in the left upper lung zone. He was symptom-free. A sputum smear contained acid-fast bacilli. A left artificial pneumothorax was induced and pleural adhesions were divided. The pneumothorax was continued for three and a half years. The tuberculoma soon lost its cavity, and the sputum became free from tubercle bacilli. He was discharged from hospital in May, 1946, and commenced a university course in 1948.

Except for slight shrinkage and the development of calcification, the tuberculoma showed little change until July, 1953, when it appeared a little smaller. In the next X-ray examination of January, 1954, the lesion had disappeared except for some fine calcified spots. He had noticed no cough or sputum. Examination of laryngeal swabs gave negative results. He continued his legal practice, and subsequent investigations have revealed no further X-ray change, with no tomographic evidence of cavitation. Repeated examination of laryngeal swabs has given negative results. His condition was satisfactory when he was last examined, more than one year after disappearance of the tuberculoma.

**CASE III.**—A male patient, aged thirty years, who in 1946 had normal X-ray findings in his chest, in August, 1947, was found to have lesions in the right mid-zone consisting of several nodules about one centimetre in diameter. He had a slight cough and a little sputum. He was admitted to

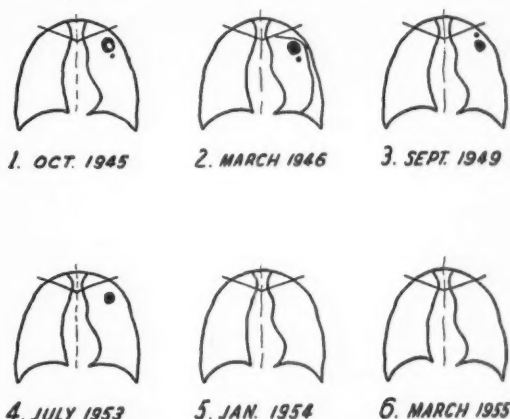


FIGURE I.

Case II: The tuberculoma with cavitation was discovered in October, 1945. The patient was treated by a pneumothorax for three years. After a long period of stability the lesion disappeared (January, 1954). No further change in the next year.

hospital in March, 1948. The Mantoux test produced a positive result. Attempts at culture of acid-fast bacilli from sputum and gastric contents gave negative results. It was considered that he had a tuberculous lesion which had developed since 1946 and had become quiescent. He was discharged from hospital in April, 1948, to resume work as a nurseryman.

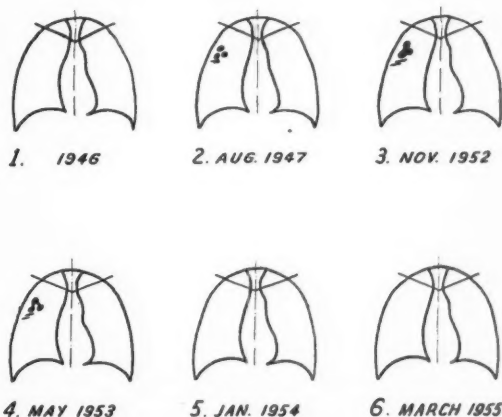


FIGURE II.

Case III: In 1946 the X-ray picture was clear. Nodular lesions were discovered in August, 1947. In May, 1953, the lesions were a little smaller, and they had disappeared by January, 1954. There was no further change in the following year.

During the next five years the lesions became rather dense in appearance, but were otherwise unchanged, until an X-ray examination in May, 1953, showed the lesions to be a little smaller. In the next X-ray film taken in January, 1954, the group of nodules had all disappeared, some fine linear markings being left. He had not noticed any special symptoms, and had only a slight cough and trace of sputum.

He felt well and continued work. Examination of laryngeal swabs gave negative results, and subsequent tomographic examination failed to reveal any residual cavitation. There has been no further radiological change, and further cultural examinations of gastric contents and laryngeal swabs have given negative results for more than a year since the disappearance of the lesions.

**CASE IV.**—Because of several episodes of bilateral epididymitis, this patient had been investigated for tuberculosis in 1945 and 1947, when X-ray films showed some small calcified foci in the right upper zone. The Mantoux test produced a positive result. The next available X-ray film was taken in October, 1952. In this film a rounded lesion 1.5 centimetres in diameter was observed in the right upper lung zone. The patient was then aged twenty-nine years. He had a slight cough and had noticed lassitude during the preceding twelve months. Bacteriological investigations gave negative results. The lesion was considered to be quiescent, and apart from twelve days in hospital, the patient continued his normal activities working as an insurance inspector. The lesion remained unchanged until May 7, 1954, when an X-ray examination showed that it had disappeared, leaving what appeared to be a small thin-walled space. This space disappeared during the next three months and bacteriological investigations gave negative results. In February, 1955, there had been no further radiological change, and the examination of laryngeal swabs gave negative results.

**CASE V.**—A male patient, aged twenty-nine years, was admitted to hospital in June, 1949; an X-ray examination of the chest disclosed rounded ill-defined lesions in the upper zones of both lungs. The Mantoux test produced a positive result. Bacteriological investigations gave negative results. He was considered to be suffering from pulmonary tuberculosis, and this opinion was subsequently confirmed bacteriologically. Treatment consisted of bed rest. At first the lesion in the right lung became a little enlarged, and eccentric cavitation occurred. Cavitation also occurred in the lesion at the apex of the left lung. Later both lesions became solid and better defined. He was eventually discharged from hospital in June, 1950, with inactive disease.

The patient was treated by further bed rest between August, 1952, and June, 1953, after radiological evidence had been obtained of a slight increase of disease in the left lung. Calcification developed in the right-sided tuberculoma, but it was otherwise unchanged.

In June, 1953, the right-sided tuberculoma appeared a little larger, and by December, 1953, it had disappeared completely except for some linear markings. The patient had no unusual symptoms and had remained at work. Examination of laryngeal swabs gave negative results, and tomograms revealed no cavitation. There has been no further X-ray change in the right lung; but in September, 1954, further activity developed in the left lung, and laryngeal swab findings became positive. The patient was readmitted to hospital. He had had active disease in the left lung as recently as August, 1952, and so the recurrence in this lung is unlikely to be due to the disappearance of the right-sided tuberculoma.

**CASE VI.**—A male patient, aged twenty-two years, developed right-sided pleuritic pain in October, 1947, and in December an X-ray examination revealed mottling in both lungs. The lesions increased in extent, and on his admission to hospital in January, 1949, he had cavitation in the upper lobe of the left lung and ill-defined opaque areas in both lungs. The sputum contained tubercle bacilli. During the next year one of the opaque areas in the lower lobe of the right lung formed a tuberculoma.

During the next four years the patient was treated for long periods in hospital. He received streptomycin and PAS in two courses, each of three months, and a left artificial pneumothorax was induced and maintained for three years. Cavitation persisted in the apex of the lower lobe of the right lung until the segment was resected in April, 1953, after three months' treatment with INAH. A small broncho-pulmonary fistula developed temporarily.

During these years the tuberculoma in the lower lobe of the right lung had remained unchanged except for the development of some calcification. It appeared a little larger on April 2, 1953, and then decreased in size over the next few months; by August, 1953, it had disappeared, leaving a small cystic space 0.5 centimetre in diameter. His sputum became free from tubercle bacilli after the resection, and remained so in spite of the disappearance of the tuberculoma. He was discharged from hospital in January, 1954.

In April, 1954, the patient had a small haemoptysis, but there was no radiological change and the sputum was still free from tubercle bacilli. There has been no further radio-

logical change except that the small irregular space has contracted into a small scar. During more than eighteen months' observation of the patient since the tuberculoma disappeared there has been no evidence of activity of the tuberculous process. He has commenced work.

**CASE VII.**—In a routine chest X-ray examination, a male patient, aged thirty years, was found to have two rounded lesions in the upper lobe of the left lung, with linear markings leading to the hilum. The larger lesion was two centimetres in diameter. His sputum contained acid-fast bacilli, and he was admitted to hospital in December, 1945.

A pneumothorax was unsuccessful and he was treated by bed rest. Cavitation occurred in the larger of the nodular lesions, and it became smaller and then later solid. This process was repeated several times after his discharge home in April, 1947. Fluctuation in size of the lesion occurred up till September, 1953, when the tuberculoma disappeared except for small residual markings. Cultural examination of laryngeal swabs gave negative results. The patient remained well without relevant symptoms, and continued his occupation as a factory manager. There was no further change until thirteen months later, when a lesion reappeared at the site of the tuberculoma and some extension of disease occurred in the left mid-zone. Cultural examination of laryngeal swabs now gave positive findings for acid-fast bacilli.

It is to be noted that there was no long period of stability of the lesion prior to its evacuation.

**CASE VIII.**—A male patient, aged twenty-eight years, was admitted to hospital in March, 1943, with respiratory tract symptoms. An X-ray examination revealed irregular infiltration in the upper lobe of the right lung, and a cavity at the apex of the right lung. His sputum contained acid-fast bacilli. He received routine sanatorium treatment and the cavity closed, the other lesions decreased in size, and one of them formed a well-defined oval shadow two centimetres by one centimetre in area. His sputum ceased to contain acid-fast bacilli, and he was discharged from hospital in October, 1943.

During the next two years he had several haemoptyses and then became asymptomatic.

In an X-ray film taken in 1947, the oval lesion had decreased to one centimetre in diameter, was more rounded, and had become stippled with calcium. There was no significant change during 1948 and 1949. In May, 1950, the tuberculoma had disappeared except for small calcified spots. The patient remained without symptoms and continued working. Examinations of sputum smears during the next two years gave negative results. There has been no further radiological change during the last four years, and the residual lesions appear inactive.

### Discussion.

One of the interesting features has been the harmless nature of the disappearance of the tuberculomata in seven of the eight cases. Although it is possible that activity may yet occur at the site of the lesions, this must be considered unlikely in view of the time during which the condition in each case has remained inactive since the lesions disappeared.

The outstanding feature of the seven cases in which a tuberculoma disappeared harmlessly is that the lesions were stable for at least eighteen months preceding their dissolution. This preceding stability is probably the decisive factor, as it is generally accepted that tuberculomata of recent activity usually produce sequelae when evacuated. The single case in this series in which activity developed was in that category.

The method of dispersal of the tuberculomata is believed to be evacuation rather than absorption, because longstanding and partially calcified tuberculomata are unlikely to change sufficiently rapidly to allow their complete absorption in a relatively short period. Also, in two cases a small thin-walled space appeared at the site of the lesion after its disappearance. Such a space requires a communication with the bronchial tree for its existence, and is strong evidence that the tuberculomata were evacuated. That none of the patients had symptoms suggesting expectoration of the tuberculomata is not inconsistent with the hypothesis, as the lesions may have been expectorated in a liquid or semi-liquid state.

Medlar (1950) holds that necrotic lesions, including tuberculomata, frequently have a bronchial connexion, and

he points out that when liquefaction occurs the lesions are readily evacuated. He also makes the following statement:

The sloughing of a necrotic tuberculous lesion may and often does occur at a time when the bacilli are present in large numbers. Also, sloughing may occur at a time when the bacillary content is low or even non-existent, although the latter condition is unusual.

This latter circumstance may have been the reason for the harmless nature of the evacuation in the present series. There is evidence that tubercle bacilli will become non-viable in a closed tuberculous lesion either spontaneously (Katz, 1953) or after chemotherapy (D'Esopo *et alii*, 1953). Further, Auerbach *et alii* (1953) failed to find viable tubercle bacilli in a specimen containing liquefied tuberculous lesions.

In the present cases, the following sequence seems likely. During the prolonged period of stability of the lesions, the bacilli perished (without the help of chemotherapy except in one case). Eventually the lesions liquefied and established a communication with the bronchial tree. The contents were evacuated quite harmlessly, an empty shell being left which contracted to a small scar.

Irrespective of the exact pathological and bacteriological processes, it would appear that tuberculomata which remain stable for several years are generally harmless if evacuated. Such lesions resemble extinct rather than live volcanoes.

It follows that if tuberculomata can be kept quiescent during the critical early period—for example, by prolonged chemotherapy—then the case for resection of such lesions needs careful reexamination.

This conclusion supports that of Moyes (1951) and of Hillerdal (1954); from extensive observations of tuberculomata, they concluded that as a general rule medical treatment of these lesions is preferable to resection.

#### Summary.

The relatively sudden disappearance of tuberculomata of the lung has been described in eight cases. During the subsequent observation period of nine months to four years, seven of the patients have shown no evidence of tuberculous activity attributable to the original lesion or its evacuation.

In the seven cases in which the phenomenon was harmless, there was a uniform lengthy period of quiescence of the tuberculomata prior to their disappearance.

It is postulated that the lesions were evacuated after the tubercle bacilli had perished or become non-viable. The phenomenon appears to be a final phase in the natural history of tuberculomata, and occurs sufficiently frequently to warrant a critical reappraisal of the policy of resecting tuberculomata and other "closed" lesions.

#### Acknowledgements.

I wish to thank my colleagues at the Chest Clinic for referring some of the patients to me, Miss G. Thomas for secretarial assistance, Mr. A. Pickford for the diagrams, and the Chairman of the Repatriation Commission for permission to submit this paper for publication.

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#### Addendum.

Since completion of this paper further evidence has been obtained of the frequency of harmless evacuation of tuberculomata, by the discovery of two additional cases amongst the records of the 2000 out-patients forming the basis of this study. In both instances the tuberculomata had been inactive for a long period of time prior to evacuation, and in neither case has there been any evidence of active tuberculosis during a subsequent period of more than two years.

## Reports of Cases.

### CONGENITAL PURE RED CELL ANÆMIA OR ERYTHROGENESIS IMPERFECTA.

By MARGARET HARPER and GERTRUDE GEIKIE,  
*Sydney.*

WHEN D. E. ANDERSON (1952) reported a case of congenital pure red cell anæmia under the title "Chronic Regenerative Anæmia of the Newborn" in this journal, he gave a full description of the general clinical and hæmatological features with the prognosis and treatment as far as our knowledge goes at present.

The purpose of the present report is to record the case of a female child who has been under our care for ten years and six months with congenital pure red cell anæmia, in the hope that it may add something to our scanty knowledge of this type of anæmia. The condition is so rare that Whitby and Britten (1950) state that "it is of theoretical interest only". However, in their 1953 edition or "Disorders of the Blood" they quote three cases from Cathie's article (1950) describing five cases from the Great Ormond Street Hospital. It is becoming evident that this anæmia of infancy is not so rare as has generally been thought. Three cases are known to us, including Dr. Anderson's. Two of these have not been reported so far.

#### Clinical Record.

B., a female infant, was born on March 4, 1944. She is the only child of healthy, unrelated parents. The pregnancy and confinement were normal. There was no family history of anæmia of any kind. The report on the child's blood group from Dr. R. J. Walsh is as follows: father, O CDe—cde (R r) MN, S; mother, O CDe—cDe (R<sub>1</sub> R<sub>2</sub>) M, S; child, O CDe—cde (R r) M, S. The serum of the mother was tested against the red cells of her husband and her daughter by the indirect Coombs test; no incompatibility was found. These findings were established after the giving of transfusions to the patient had ceased.

The birth weight of B. was six pounds 12 ounces, and she was breast fed for six months with a complement of fresh cow's milk. The baby made satisfactory progress for the first few weeks. Her mother noticed her pallor when she was eight weeks old. She came under our observation when she was eleven weeks old. Her general condition was good, and no abnormality was found except her extreme pallor. There was no enlargement of liver or spleen, and her weight was satisfactory. A blood count gave the following result: the red blood cells numbered 1,210,000 per cubic millimetre, and the hæmoglobin value was 3.8 grammes per 100 millilitres. The red cells were irregular in size and a few macrocytes were present. There was little poikilocytosis. The cells were mostly full of hæmoglobin and stained well. No nucleated forms were seen. The white cells were mature and platelets were plentiful. The leucocytes numbered 10,000 per cubic millimetre and presented no abnormal features.

The baby was given a transfusion of blood. Two weeks later the red cells numbered 3,160,000 per cubic millimetre and the hæmoglobin value was 7.38 grammes per 100 millilitres. The child seemed perfectly well; but four weeks later the red cell count was 2,480,000 per cubic millimetre and the hæmoglobin value 6.68 grammes per 100 millilitres, and another transfusion was given.

There being no adequate evidence available of the optimum size of transfusions and their spacings, when it



became evident that blood transfusions would have to be given at intervals it was decided that the indication for their renewal should be the clinical condition of the baby as observed by the mother. No attempt was made to maintain the red cell count or haemoglobin value at the amounts which would be regarded as normal for the child. The mother very quickly learned from the condition of the infant to recognize that a blood count was necessary. Irritability, lack of appetite and pallor appeared to be the indication that the red cells needed to be replenished. It was found that when the foregoing symptoms were present the blood count showed that the red cells numbered just over 2,000,000 per cubic millimetre and the haemoglobin value was five to six grammes per 100 millilitres, and transfusions were given. It is interesting to note that Carl H. Smith (1953) makes the statement that "of major importance is to determine the actual need for transfusion, not in terms of a fixed haemoglobin value but in relation to the clinical signs and symptoms manifested by the patient with promise of their relief by this form of treatment".

It was thus established that transfusions were required every six to eight weeks. In the early days on a few occasions the interval between the transfusions was four to six weeks. Later the intervals gradually lengthened to three months. The amount of blood given at a transfusion in infancy was estimated at 10 millilitres per pound of body weight. As the child grew older this amount was increased to about 450 millilitres. From 1947 to 1949, because of the increasing difficulty of finding suitable veins, larger transfusions of about 900 millilitres were given by the drip method lasting for about twenty-four hours.

One of us (G.G.) was responsible for giving the transfusions, and during the five year period she did not find it necessary to use the larger veins or bone marrow infusions. Citrated blood, as fresh as possible, was used, but packed cells were not given. The total number of transfusions given was 26.

#### The Blood Counts After the Transfusions Ceased.

For the first six months without transfusions the red cell count varied from 2,500,000 to 3,400,000 per cubic millimetre, with a haemoglobin value of eight to eleven grammes per 100 millilitres. In December, 1949, the child suffered from chicken-pox, and for the first time reticulocytes (3.5%) were present with an occasional nucleated red cell (one per 100 leucocytes) in the peripheral blood.

In May, 1951, she suffered from stomatitis, and this was followed by an increase in the total number of red cells to 4,100,000 per cubic millimetre with a haemoglobin value of 11.7 grammes per 100 millilitres. This increase was maintained for four months, after which the figures dropped again to 3,500,000 cells per cubic millimetre and a haemoglobin value of 10 to 11 grammes per 100 millilitres. This has been maintained until the present time.

#### Comment.

The child has been strikingly free from infections—indeed, she has had less infection than would be expected in normal childhood. When she was eighteen months old she had a mild attack of hepatitis, and her mother developed a more severe attack later. This, with the chicken-pox and stomatitis already mentioned, are the only infections she has had. She is still having blood counts every four to six months, and on these occasions she is examined by one of us (G.G.). She is a well grown, healthy child, and both physical and mental development are normal. She has always lived a normal life, going to school, and has never been treated as an invalid. Her progress confirms the observations of others who have had children with this condition under their care—namely, that they seem to adjust themselves to low levels of haemoglobin and erythrocytes without showing evidence of embarrassment of the heart or of anoxemia.

Diagnosis is based on a recurring anaemia appearing in the neonatal period or later in infancy. The red cells are normochromic and mainly normocytic. Occasionally macrocytes and microcytes are present. The macrocytes in this

case appeared to be more plentiful in the stained films as the anaemia increased, but evidence of red cell regeneration—that is, reticulocytosis or the presence of nucleated red cells—was absent. Platelet counts are normal, as are the numbers of granulocytes and lymphocytes. Cathie (1915) reports that the latter respond to normal infection in the expected way, granulocytosis accompanying pyogenic infections, while one patient who contracted whooping-cough showed the characteristic lymphocytosis. Examination of the bone marrow is necessary to confirm the diagnosis in these cases. The marrow presents the characteristic picture of red cell hypoplasia with absence of other abnormal features. The marrow in this case was examined on one occasion only, by Dr. Douglas Reye, who reported that sternal marrow puncture and the tissue section showed that there was an appreciable reduction in the number of nucleated red cells. The marrow was of normal cellularity. Megakaryocytes were numerous and the myeloid series was normal. He considered the findings those of a red cell hypoplasia.

TABLE I.

Period.	Number of Transfusions.
1944 (June to the end of the year) .. .. .	4
1945 .. .. .	7
1946 .. .. .	6
1947 .. .. .	4
1948 .. .. .	3
1949 (January to April 23) .. .. .	2
Total .. .. .	26

Cathie has shown in one case, by marrow cultures examined in serial smears, that normal maturation from proerythroblast to fully haemoglobinized normoblast took place, but at the late normoblast stage no further maturation to reticulocytes occurred.

#### Prognosis.

These children can be kept alive for long periods if blood transfusions are given as required. Little is known of the ultimate prognosis, owing to the rarity of the condition and to the fact that it has been studied for such a short time. Of the first five patients reported by Blackfan *et alii* (1944), one died of fulminating pneumococcal septicaemia after seven years of repeated transfusions. Two patients continued with blood transfusions at intervals of about eight weeks, and had neither improved nor retrogressed through the many years during which they were followed. The eldest, aged eleven years, was fully developed and normal in every respect except for recurring anaemia. One has made a "complete recovery" after two years of supervision and treatment. This child now maintains an erythrocyte level of about 3,500,000 per cubic millimetre with no tendency to improve beyond this despite the usual hematopoietic stimulants. Others have reported patients who after a period in hospital with repeated blood transfusions have returned to their homes and have died because transfusions were no longer given.

#### Treatment.

In the present state of our knowledge the only treatment that will keep these children alive is replenishment of the peripheral red cells with donor cells as fresh as possible. Carl H. Smith (1953) has pointed out that the possibility of aggravating or prolonging a hypoplastic state by inappropriate spacings of blood transfusions is conceivable because of the empirical methods employed in treatment. There is experimental evidence given in studies by Birkhill *et alii* (1951) and by Tinsley *et alii* (1949) that there is a lessened stimulus to the marrow because of the increased availability of oxygen from transfused cells.

There also seems to be no doubt that prolonged treatment with blood transfusions may produce hemochromatosis, and cases have been reported in which hemochromatosis has occurred when it has been necessary to treat congenital



pure red cell anaemia with blood transfusions for many years. It therefore seems advisable to be guided by the clinical signs and symptoms with regard to the frequency and quantity of the blood transfusions, and thus perhaps reduce the likelihood of these complications.

In common with other observers we have found that no known hæmatinic or other drug has any effect on the recurring anaemia. In the present case intramuscular injections of liver extract, folic acid and iron all failed to improve the condition. Carl H. Smith has reported two cases in which one patient was given ACTH and the other cortisone, but neither showed any response in bone marrow or peripheral blood. Others have also found that the steroids produced no effect on this anaemia. The only report known to us in which success has been claimed for treatment with ACTH or cortisone is that of Fisher and Allen (1953); but the history of the patient suggests that the condition may not have been true congenital red cell anaemia. Carl H. Smith reports a case quoted by Gasser (1951), who found a noticeable return of erythropoiesis in the bone marrow with amelioration of the anaemia following the use of cortisone in the treatment of an infant in whom a condition "closely resembling pure red cell anaemia" followed measles. Splenectomy has been performed on several patients by Blackfan *et alii* (1944), by Cathie (1950) and by others. None of these observers has been able to decide that the operation has been effective in any way.

#### **Ætiology.**

Cathie (1950) states that all standard laboratory investigations have failed to bring this condition into line with any known pathological condition. Blackfan *et alii* state that present investigations favour the theory that this anaemia may be associated with an inborn error of metabolism of pigments or substances concerned in erythropoietic activity, or with an early exhaustion of the erythropoietic tissue. Carl H. Smith suggests that pure red cell anaemia is a congenital anomaly on the same basis as other malformations. He quotes a personal communication from James A. Wolff, of New York, stating that he has observed congenital red cell anaemia in two siblings in one family. This appears to be the first evidence of any familial occurrence of this condition.

#### **Summary.**

Congenital erythropoiesis imperfecta in a female infant has been successfully treated by blood transfusions for five years. The child has developed normally and has required no treatment for the last five and a half years. She is kept under supervision with regular blood counts, which show that she is now producing her own red cells, although at a somewhat lower level than would be accepted as normal for a child of her age.

#### **Acknowledgements.**

We have pleasure in expressing our gratitude to Dr. Marjory Little for much helpful advice in constructing this report, and to her and her colleagues for the blood counts; to Dr. Douglas Reye for the report on the bone marrow and for directing the supervision of the supply of blood for the transfusions in the early days; and to Dr. R. J. Walsh for the report on the blood groups and for the supply of blood from the Red Cross Blood Bank.

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#### **Addendum.**

Since completing this report we have received a personal communication from Dr. Carl Smith, of New York, conveyed by Professor Charles D. May, that he has had a similar experience with children who have gradually acquired the capacity to maintain their own blood after a prolonged period of dependency upon transfusions.

Dr. Louis K. Diamond, in a personal communication, writes as follows: "We have had four of these patients who developed spontaneous remission between one and a dozen years after the condition was first noted. Of these four, one died of intercurrent infection before the days of anti-biotics, and three are alive and well, five, nine, and eighteen years after their last transfusion."

#### **LITTRÉ'S HERNIA.**

By C. LEGGETT,  
Brisbane.

LITTRÉ'S HERNIA is a hernia containing an intestinal diverticulum alone.

The term is usually applied to a strangulated hernia containing Meckel's diverticulum alone. Meckel's diverticulum is occasionally found in a hernial sac associated with other visceral contents, but a true Littré's hernia is rare.

It is interesting to note that Littré in A.D. 1700 described several cases of the type of hernia associated with his name; but it was not until the early part of the nineteenth century that Meckel's diverticulum was described by Johann Frederick Meckel, 1810 ("Ueber die Divertikel am Darmkanal").

#### **Biographical Notes.**

Alexis Littré (or de Littré) was born on July 21, 1658. He was the son of a merchant and one of 12 children. He became interested in medicine by doing rounds with a local practitioner of medicine, and was accustomed to record each night the clinical records of the patients visited during the day. He went to Paris in 1683, and became greatly interested in anatomy and did an enormous amount of dissection. During one long and cold winter it is said that he dissected more than 200 bodies. He was a poor orator, but a clear demonstrator. He remained a bachelor and had no social interests whatever, but was very punctilious in the performance of his professional duties. He suffered a cerebral hæmorrhage and died on February 1, 1725.

Littré described the type of hernia associated with his name in the *Mémoires de l'Académie royale des sciences (Paris)* of August 18, 1700. The following quotation is taken from the commencement of the article:

#### **OBSERVATION SUR UNE NOUVELLE ESPÈCE DE HERNIA.**

PAR M. de LITRÉ.

J'ouvris le 30 Juin, 1699, le Cadavre d'un homme fort charnu, mort subitement à l'âge de quarante-huit ans, avec une Hernie à l'aîne gauche, qui avait commencé après un effort, cinq ans avant sa mort et qui était insensiblement descendue jusqu'au fond du Scrotum. Parcourant les intestins grêles de ce Cadavre les uns après les autres, étant parvenu vers la fin de l'Iléon, je m'aperçus qu'il était arrêté par une de ses parties dans le sac de la Hernie; j'eus de la peine à l'en retirer, quoiqu'il n'y fût retenu par aucune adhérence.

La circonférence entière du corps de l'intestin ne formait pas cette Hernie, comme il arrive ordinairement; mais seulement la partie opposée à celle qui est attachée immédiatement au Mésentère.

Littre described certain of the salient clinical features of this type of hernia, and pointed out especially that "the patient goes to stool during the whole course of the illness as the intestinal canal being uninterrupted, the excrements are at perfect liberty to pass from one end to the other".

Littre did not know of the existence of Meckel's diverticulum, and thought that the diverticulum was a traction diverticulum and that the strangulated condition was of the nature of an exaggerated Richter's hernia.

Meckel, who described the diverticulum, was an eminent pathologist and anatomist, and was probably the greatest German comparative anatomist before Müller. He was Johann Frederick Meckel (1781 to 1833) the younger, as his grandfather, J. Frederick Meckel the elder, was the man who in 1748 described Meckel's ganglion of the fifth cranial nerve and also the submaxillary ganglion.

#### Clinical Features.

Although Meckel's diverticulum is estimated by anatomical studies to be present in approximately 1% of subjects, it is not a very obtrusive structure in surgical practice; its presence was recognized only 15 times in 10,600 abdominal operations in one series at the Mayo Clinic.

As far as can be assessed, strangulation of a Meckel's diverticulum in an external hernia constitutes only a small percentage of the surgical complications of that diverticulum.

Approximately 50% of the cases of Meckel's diverticulum encountered in external herniae have involved inguinal herniae. Approximately 30% have occurred in umbilical herniae, and the vast majority of these have occurred in newborn infants.

The majority of the remainder have occurred in femoral herniae; but the incidence of this condition cannot be great, because Richard Sweet briefly reviewed the histories of the 14 cases reported in the literature from 1700 to 1929.

A further number of cases have been reported since, especially in the provincial medical journals of America.

Meckel's diverticulum has been described as the sole occupant of rare herniae. One such Littre's hernia has been reported in a femoral hernia of the lateral type (that is, a hernia lateral to the femoral vessels—Hesselbach's hernia). One has been described in a greater sciatic hernia. In the Italian literature a very interesting case of osteoperiostitis of the upper end of the femur following suppuration in a strangulated femoral hernia of Littre's variety has been described.

#### Clinical Record.

A male patient, aged sixty-two years, a hairdresser, in apparently perfect health, was engaged in unaccustomed physical effort when he felt a painful swelling in the right inguinal region. Although the swelling became progressively more painful and tender, he did not vomit, his bowels acted normally and he did not seek medical advice until thirty hours later.

On physical examination of the patient, there was a tender, tense swelling in the region of the right inguinal canal, reaching into the upper part of the scrotum. The abdomen did not appear distended, but tenderness was present in the lower part of the abdomen to the right of the mid-line.

A provisional diagnosis of strangulated inguinal hernia was made, and exploration was carried out under general anaesthesia. The sac contained foul-smelling, blood-stained fluid and a black segment of bowel which, when delivered, was found to be a blind diverticulum 10 centimetres long and approximately three centimetres in diameter. The strangulation had occurred at the very base of a wide-necked Meckel's diverticulum, and the strangulating mechanism was the edges of the internal inguinal ring.

It did not seem feasible to resect the gangrenous diverticulum alone, because of the width of the neck of the diverticulum, and because the gangrenous area extended right on to the intestinal wall. A piece of small

intestine 15 centimetres long was resected, a two-layer end-to-end entero-anastomosis was performed and the bowel replaced through the inguinal incision. The hernia was repaired, the patient made an entirely uneventful recovery and was discharged from hospital on the thirteenth post-operative day.

#### Summary.

A case of Littre's inguinal hernia is reported. Some historical, biographical and clinical facts in relation to Littre's hernia are included.

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#### Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"Gestation: Transactions of the First Conference, March 9, 10 and 11, 1954, Princeton, N.J.", edited by Louis B. Flexner, M.D.; 1955. New York: Josiah Macy Junior Foundation. 9" x 6", pp. 238, with 97 illustrations. Price: \$5.00.

Contains papers with discussion on the functional role of the placenta, problems of sugar transport in the placenta of the ungulate, and the comparative anatomy and histology of the placental barrier, with an appendix on enzymes of the human placenta.

"Cold Injury: Transactions of the Third Conference, February 22, 23, 24 and 25, 1954, Fort Churchill, Manitoba, Canada", edited by M. René Ferrer, M.D.; 1955. New York: Josiah Macy Junior Foundation. 9" x 6", pp. 226, with 30 illustrations. Price: \$4.50.

Contains papers with discussion on the interrelationship of circulatory and metabolic factors, metabolic studies of the Eskimo, a comparative study of young Eskimo and Indian males with acclimatized white males, studies of fat distribution and respiratory quotient, and diet and survival, and the roles of ascorbic acid and subcutaneous fat in the prevention of cold injury in man.

"Ionography: Electrophoresis in Stabilized Media", by Hugh J. McDonald, D.Sc., in collaboration with Robert J. Lappe, M.S., Edward P. Marbach, Ph.D., Robert H. Spitzer, M.S., and Matthew C. Urban, Ph.D.; 1955. Chicago: The Year Book Publishers, Incorporated. 8½" x 5½", pp. 278, with 28 illustrations. Price: \$6.50.

A summary of present knowledge regarding electromigration in stabilized media.

"The Many Faces of Love", by Hubert Benoit, translated from the French by P. Malret; 1955. London: Routledge and Kegan Paul, Limited. 8½" x 5½", pp. 316. Price: 28s.

The author aims "to survey the vast realm of psychology governed by love in general, in all its forms, and to show how all the many elements in this domain are linked together in an architectonic order by metaphysical notions that are definitive for the condition of humanity".

"The Management of Acute Poliomyelitis", by C. P. Stott, S.R.N., C.M.B. (Part I), and M. Fischer-Williams, M.R.C.P. (Ed.), with a foreword by W. Ritchie Russell, C.B.E., M.D., F.R.C.P. (Ed.), F.R.C.P. (London); 1955. Edinburgh and London: E. and S. Livingstone, Limited. 8½" x 5½", pp. 112, with 43 illustrations. Price: 12s. 6d.

Written primarily for nurses.

## The Medical Journal of Australia

SATURDAY, AUGUST 13, 1955.

*All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.*

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### THE REHABILITATION OF PRISONERS IN NEW SOUTH WALES.

In June, 1947, Walter Langdon Brown, an experienced and wise physician, was quoted in these columns as having written that the province of medicine was conterminous with life—that "nothing which throws light on life is alien from the subject to which we devote our very existence". We added that though most medical practitioners knew this to be true and were prepared to extend the horizon of medicine in all directions, there were possibly some who had to be reminded of it when they were asked to turn their attention to such a subject as criminology. The community as a whole stands in need of instruction in the causes of crime and in what can be done to reduce its incidence; the treatment of the criminal is only one aspect of this subject. People need to realize that if social conditions which predispose to crime exist and are allowed to continue, then society itself is in a measure responsible for some of the criminal acts of its members. Clearly, predisposing causes of crime, as of bodily illness, have to be removed. At the same time too much emphasis must not be laid on predisposing causes; it is easy to do this and to forget that it is the individual himself who is responsible for what he does. Under predisposing causes to crime might be named the squalor of slum areas with its attendant evils, poor housing generally, lack of education and the rest. Not so many years ago poverty would have been added to the list, but, at least in Australia, poverty today is not the ugly-headed hydra that it used to be. There is little unemployment,

conditions of work are as a rule good, and, though there will always be difference of opinion about them, wages are satisfactory—a man who is willing and is looking for work will be able to find it and support those dependent on him. The poverty that does lead to criminal acts is chiefly that which arises because a man is not physically or mentally able to take proper care of himself. Turning aside from the predisposing causes of crime to the criminal himself, we may define him as one who refuses to obey or sets at nought the laws and general requirements which society, through its law-makers, has laid down for its own protection and well-being, or for the protection and well-being of the individual members constituting it. Incidentally, if a law is unjust or stupid, the individual infringing it will be held by most people to be free from blame in a measure estimable by the degree of injustice or stupidity of the enactment; he will, however, probably be punished just the same. The real causes of crime must, as already stated, be sought in the individual and in his environment, but an attempt to define the share taken by each of these would be as futile as it would be time-consuming. We know that criminal tendencies, like some other tendencies, may be inherited. On the other hand, we cannot say that law-abiding children of worthy parents are as they are because of the admirable qualities of their progenitors. Again many a citizen, highly esteemed and honoured by the community, has had an origin which might be thought likely to produce law-breakers. Mr. L. C. J. Nott, O.B.E., Comptroller-General of Prisons in New South Wales, put the matter well when he wrote in one of his annual reports that "the plant of criminality grows from the soil of the individual's personality in the climate of his social environment".

The present discussion is concerned with the rehabilitation of the criminal when he has been convicted and is, to be punished for his offence. First of all we must therefore know what type of man he is. Mr. L. C. J. Nott in his report for 1952 described types of prisoners in the following terms:

Frequently, it seems that the lay mind does not realise that the prison population consists of a number of human beings who differ from one another in the same way and to the same extent as any other group of human beings; the only thing they all have in common is that they have been convicted of some breach of the law. Some of them are professional men who have betrayed the trust reposed in them; others are the drunken mendicants from the streets of the city. Some are people who have made one serious mistake; others regard crime as a normal means of livelihood. Some are subservient and obsequious; others are arrogant and aggressive; some are highly intelligent, others are mentally deficient. Most are good prisoners and a few are bad. They are an endless variety of individuals, to each of whom imprisonment means something different and, therefore, affects differently. The effect is largely dependent on their pre-prison environment—intelligence, social background, moral standards, educational training and so on.

It will at once be clear that a prison population comprising individuals of such diverse characteristics and attainments will need several different types of institution if the serving of a prison sentence is to be of any benefit to the individual and to society. It should not be necessary to point out that imprisonment for a criminal act is not intended to be merely punitive; no enlightened community holds such a view today. To lock a man up for a period of months or years and to let him loose again after that



period without having made any attempt to fit him for community life would be stupid in the extreme—such a procedure would produce kinks in an already warped mind and add resentment, fury and despair to further inevitable antisocial actions. There will be some for whom nothing can be done—as Mr. Nott states, they are “bad” and “regard crime as a normal means of livelihood”. Of such are those who are declared habitual criminals, who receive a sentence known as a “Kathleen Mavourneen” (“it may be for years and it may be for ever”). Most of the others derive some benefit from their life in prison. In order that members of the medical profession should gain some knowledge of modern prison methods and objectives a study has recently been made of prisons in New South Wales. In addition to the State Penitentiary at Long Bay, Sydney, the Goulburn Training Centre (an institution of maximum security), Berrima Training Centre (medium security) and Emu Plains Training Centre (minimum security) have been visited by the Editor of this journal in the company of Mr. L. C. J. Nott, Comptroller-General, and several of his officers. Clarity will best be served if we trace the course which a prisoner or a batch of prisoners may take from the time of conviction and sentence, through the period when they are in custody, to the time of their release.

On receipt of a sentence a prisoner is sent to the State Penitentiary at Long Bay. This is an institution with a prison population averaging between 700 and 800 a day. During the year 1952-1953 a total of 9564 individuals were dealt with. Many with short sentences do not leave Long Bay, but are discharged at the end of their “time”. Experience has shown that nothing much can be done in the way of training for rehabilitation in less than about nine months. Efforts at training and rehabilitation are therefore confined to prisoners whose sentences are twelve months or more—a period of about two months must elapse before their final disposal can be decided. Prisoners of this category are sent to the “allocation centre”. Each prisoner is questioned and a careful history is taken of his past, and statements are obtained from his parents or next of kin and from his previous employer if he has had one. He comes before the prison psychologist and is submitted to various tests, including estimation of his intelligence quotient, and the results are recorded. He is seen by the resident medical officer of the prison. (It is the policy of the department to correct any physical disability that is present.) He is put to work at tasks which any unskilled person can undertake and the officer in charge of the section takes note of his behaviour—whether he manifests docility or resentment, alertness or apathy, understanding or dullness. Sometimes it is necessary for him to be examined by the permanent psychiatrist of the department; the psychiatrist writes a report and may make certain recommendations; sometimes he carries out suitable treatment. When the study of the individual is complete and its results are recorded, he is brought before what is known as the classification committee. The governor of the prison (who is also Deputy Comptroller) is chairman of this body and its members include the psychologist and his assistant, the resident medical officer, the director of prison education and the officer-in-charge of the working department. The prisoner is seated

and he is questioned about what he wants to do when he has served his sentence. The object of the interview is explained to him. If his education has been neglected—many prisoners are quite illiterate—he is told that he will be put to school so many times a week and that his tuition will start at a simple early stage. If he is, for example, unable to write an ordinary letter to his relatives, he is promised that by the time he is released this defect will be made good. The officer in charge of work reports on the general bearing of the prisoner. The atmosphere of the interview is one of friendly inquiry and sometimes latent capabilities will be discovered. For example, at Berrima Training Centre the department has an efficient sign-writing school and a prisoner may be sent straight to this school if the general findings warrant it. When the prisoner has been sent out of the room the committee discusses his disposal—whether he is suitable for a training centre, and if so, whether it is to be one of maximum or medium or minimum security.

At this stage the work of the departmental psychiatrist should be mentioned. The appointment of Dr. John McGeorge as consulting psychiatrist to the Attorney-General and the Department of Justice was the result of one of the recommendations made by Mr. L. C. J. Nott after he had returned from a visit overseas, made at the behest of the Minister of Justice. Departmental officers are from time to time sent overseas in order that they may make a report on their return; quite often the report is not acted upon to any great extent, but is put on one side. Not so with the New South Wales Minister of Justice, the Honourable R. R. Downing; he adopted most of Mr. Nott's recommendations and has thereby established a system which is working well and which will, we may be certain, produce in the long run results of the greatest value to the community. Prior to his appointment to the department, Dr. McGeorge studied law and was admitted to the Bar of New South Wales. Before his appointment judges and magistrates seemed to have the habit of directing that persons guilty of misdemeanours should receive “psychiatric treatment”. Nowadays this does not happen nearly so often, but prisoners are sent for “examination” by the psychiatrist. The subject of psychiatry and the criminal from its medical aspects was discussed in these columns on June 7, 1947, in the light of a paper by Dr. W. Norwood East, a well-known writer on criminology. Dr. Norwood East suggested in the article referred to that the punitive treatment of some subnormals, psychopathic personalities and psychoneurotic offenders could be carried out more intelligently than at present if the public would accept psychiatric guidance in the matter. In the Prisons Department of New South Wales psychiatric guidance is given by Dr. McGeorge when it is needed and accepted by the departmental authorities. It is reports of this kind that are sent for consideration by the classification committee; this is, of course, not the only use that is made of Dr. McGeorge's services. The point of this reference is that the whole idea must be exploded that the general application of psychiatry will be of outstanding value in the handling of all kinds of prisoners. Dr. H. T. P. Young, who has done much psychological work at Wormwood Scrubs Prison in England, may be quoted as stating that



the following types of prisoner had been found unsuitable for psychological treatment:

1. Those who are certifiable under either the *Lunacy or Mental Deficiency Act*.
2. Those who show intelligence inferiority to such a degree as to render them incapable of cooperating in treatment. An intelligence quotient below 85 would be a disqualification.
3. Those who are suffering from permanent organic cerebral changes.
4. Adults whose criminal activities show evidence of marked chronicity, or who are unwilling to cooperate in measures designed to modify their abnormal practices; and adolescents whose abnormality has existed from an early age and is combined with a closely related psychopathic heredity.
5. Those showing excessive resentment or undue resignation at their convictions or sentence.
6. Those whose attitude suggests that they have ulterior motives in seeking treatment.

When Dr. McGeorge sees a prisoner, the interview takes place in a room from which other persons are excluded and the conversation is as free and natural as it can possibly be made; Dr. McGeorge has before him all the official papers relating to the individual, and the latter tells his story and is questioned about it.

As this discussion is concerned with rehabilitation rather than with custody as such, further reference will be confined to what are known as "training centres". The Goulburn Training Centre, formerly known as Goulburn Gaol, has a daily average prison population of slightly over 300; during 1952-1953 it dealt with 1087 prisoners. To it are sent "those prisoners serving their first prison sentence or who have served only minor previous sentences, particularly those who are serving lengthy sentences". It is an institution of "maximum security", and had its beginning as a training centre in the year 1949-1950. The fundamental considerations on which it has been activated, as indeed are all training centres, are the moral, physical, industrial and educational training of prisoners. As a prisoner will eventually return to the general body of society, it is believed to be fitting that "within the particular requirements of a penal establishment his life and habits should as nearly as possible approximate those of the society into which he is to be returned and re-absorbed". Every prisoner is employed in some useful occupation and most of the labour carried out has some value to the other members of the community. Education is not forgotten and several groups of classes are held, the subjects studied being those for the Intermediate and Leaving Certificate examinations. It should be noted that prisoners from the training centres are allowed to sit for and pass these examinations, generally in stages. Correspondence courses in a variety of subjects are taken and certificates are obtained on their completion. Goulburn, like the other training centres, has a good library; the librarian is a prisoner of good intelligence with some knowledge of books, and the books are treated with care and last for a surprisingly long time in spite of all the handling which they receive. At Goulburn the prison orchestra "finds itself in complete harmony with the other aspects of prison training". Several broadcasts have been made by this orchestra and the general public has appreciated the performances.

The Berrima Training Centre (of medium security) is smaller than the Goulburn institution. During the year 1952-1953 the average daily population was 45.3 and the total number of prisoners dealt with during the year was 109. It is used for "young prisoners serving lengthy sentences who appear likely to respond to training". The Berrima Centre has the advantage of having been planned and built as a modern training centre. The inside of the old Berrima gaol was almost entirely demolished and new buildings were erected. The prisoners are as healthy looking a lot of young men as it is possible to see any where. They live in "rooms" or "huts" and not in "cells". Each room is ten feet square and contains an iron bedstead, a set of shelves divided into compartments where clothing, towels, toilet necessities, books and so on may be kept and the utmost tidiness in this is insisted on. There is a table and a seat attached to the wall, a basin is attached to the wall and running water is supplied; there is also a toilet pedestal which is covered by a three-sided box and this serves as a seat. Each bedstead is supplied with a mattress, one pillow, seven blankets, sheets, and a counterpane. The rooms are locked at night. There is a good schoolroom and classes are held regularly and some first-rate results have been obtained at examinations. The training includes carpentry and cabinet making, signwriting, market gardening, cooking, the running of a laundry and so on. The library is first rate and there are facilities for the playing of basketball and "paddle tennis". Even such matters as table manners are attended to—an individual whose behaviour at table is seen to be deficient is placed at a table with several others whose table manners are good and the correction occurs by force of example.

The Emu Plains Training Centre is a place of "minimum security"—prisoners, if they wished, could walk out, but they do not do so. They have given their word that they will not run away and they know that they would soon be caught if they did and that their plight would then be worse than before. The centre is for "young prisoners similar to Berrima but serving shorter sentences or nearing the end of long sentences". During 1952-1953 it had a daily average prison population of 87, and the total number of prisoners dealt with during the year was 352. Here many of the prisoners' "rooms" are being remodelled; others have been rebuilt. The new type of room is similar to that found at Berrima, but there is more space around the buildings. The general atmosphere is perhaps freer than at Berrima, but the routine is much the same. The work carried out is that of a large farm. Poultry rearing is an important activity and the piggery is a successful undertaking. The herd of cattle is large; milking is done by machinery and hand stripping. Much fodder is grown on the farm and is harvested by prisoners who seem to take naturally to the work. The growth of vegetables appears to be extensive and several government institutions are supplied with farm produce. Educational activities are much the same as at Berrima, but there are two class rooms. The library is good and the books are kept in a way that would do credit to any group of people living together. It should be stated that cinematograph films are shown on two evenings a week and on a third evening the films are documentary. (Similar

amenities exist at the other training centres.) Selected radio programmes are broadcast regularly. Visitors are allowed to come at regular intervals and there is no obstruction between visitor and prisoner. An officer is on duty to see that nothing is passed directly to the prisoner; all gifts have to go through the office.

Mention must be made of the State Reformatory for women. This is situated at Long Bay. During 1952-1953 the average prisoner population was 80.7 and 1137 prisoners were dealt with during the year. The cells in the ordinary blocks are carefully looked after and a model of tidiness. They have recently been redecorated in pastel colours and a prisoner is allowed to choose from those available the type of colour which she wishes to have. The "rooms" for the first offenders would be acceptable in many a small suburban home. From the first offenders' dining room a view of the sea is obtained and the room contains *inter alia* a generous supply of books, a radio, and a harmonium. The lawns on this section of the women's reformatory are well kept and their care occupies some of the prisoners' time.

A short description has been given of the workings of the training centres in relation to the general prison system in New South Wales; and it will naturally be asked what results have been obtained. The present system has not been in existence long enough to allow any statistical conclusions to be drawn, but there is no doubt that the work is proceeding along correct lines. That improvements are still needed is undoubted and is recognized by the heads of the department. For example, a training centre for officers and warders is needed and this would have been brought into being long ago if financial stringency and acute building difficulties had not intervened. The most important advances of recent years have been the establishment of the classification committee and the permanent employment of a psychiatrist with a knowledge of law who is keen on his work for its own sake. Without these two factors the training centres would not be able to function. It is extraordinary how well the men selected seem to fit into the places allotted to them. Further than this, efforts, so far apparently successful, have been made to find work for trainees on their discharge and to find suitable lodgings for them if they have no homes. The employer is made aware of the trainee's history and, of course, the communication is confidential. One danger awaits a trainee whose criminal acts achieved a certain notoriety in preceding years. If a newspaper of a certain flamboyant type hears of the release it may publish the fact. In one instance this was done and photographs of several offenders were reproduced; one offender was recognized by his workmates and his future as a free citizen was nearly wrecked. One never knows what a newspaper will do. The following paragraph is quoted from Mr. Nott's report for 1952-1953:

The incident at Grafton . . . received very considerable Press publicity and one daily newspaper, quoting a professor of the University of Sydney, said: "If prisoners were treated reasonably while inside gaol they would not try to escape." Six weeks later, two young prisoners ran away from Berrima Training Centre. The same newspaper criticized the Department for allowing the two prisoners concerned to be "doing their time in the pleasant surroundings of one of the State's model prisons".

This brings us to our final reference which is to the Parole Board. This body consists of senior active or retired officers of government departments. These men spend a great deal of time in studying the response of prisoners to prison environment and training. They have the advice of officers who have been in daily contact with the offenders. Prisoners, if well behaved, receive certain remissions of sentence; if the Parole Board comes to the conclusion that a man has become fit to live in the community as a normal citizen, they may recommend to the Minister that he be released. This is as it should be. In addition to the Parole Board, there are departmental parole officers who keep in touch with prisoners who seem likely to achieve rehabilitation. Help, as well as advice, is offered to the man about to be released; his problems are discussed with him; and many men are glad to accept the guidance offered. The work of these officers alone would be ample evidence of the department's high intentions. A man's punishment for a criminal act consists in his being deprived of liberty, and it is the duty of the Prisons Department to see that sentences imposed by the courts of justice are carried into effect. What has been under discussion is training towards rehabilitation. In one of the departmental documents it is pointed out that the word "reformation" is seldom used in connexion with penal systems, because reformation can be achieved only by the offender himself. Before some offenders can be rehabilitated they have to change the habits of a lifetime. If training is to effect such a change the person concerned must cooperate with those who are trying to guide him. Training and rehabilitation may result in reformation, and no doubt they sometimes do; often conditions are so adverse that the complete grade cannot be made. Be that as it may, the fact remains that the New South Wales Prisons Department, under its distinguished Comptroller-General, who has the sympathetic backing of his Minister, is doing a magnificent work for, and merits the complete confidence of, the whole community.

## Current Comment.

### THE PREMENSTRUAL SYNDROME.

THE term "premenstrual syndrome" was introduced many years ago by Green; it certainly is a better term than the frequently used "premenstrual tension", since tension is only a part of the syndrome, or than "premenstrual oedema", although fluid retention is the constant and basic feature. Victor C. Jacobsen,<sup>1</sup> in an article entitled "Premenstrual Edema and Related Problems", states that in 20% of women the increase in water retention in the week preceding menstruation is abnormally large and calls for treatment, while in 5% it reaches pathological levels and needs careful management. Curiously enough, Jacobsen fails to mention the fact that in many women the condition is associated with ovulation, and that infrequently it accompanies or even succeeds menstruation. When the timing is unusual, or when the physiological state is superimposed on an associated pathological condition also involving disturbance of water or electrolyte balance, the picture can become most confusing.

Women with the uncomplicated condition may notice, regularly in their menstrual cycle, an increase in weight of from two to fourteen pounds. This is accompanied by

<sup>1</sup> *New York State J. Med.*, June 1, 1955.

general vague malaise, abdominal bloating, swelling and tenderness of the breasts, and heaviness and weariness of the thigh muscles; there is probably some noticeable oedema and pitting of the ankles, and possibly oliguria. The urine becomes more concentrated and its pH may fall enough to cause local irritation; the sodium output falls, but neither sugar nor albumin appears. There is no azotemia. Katharina Dalton<sup>1</sup> describes also facial pallor and puffiness as signs of some value in recognition of the state. She also mentions albuminuria and hypertension as accompanying the oedema, but it is almost certain that her examples belong in the category of complicated cases; in ordinary uncomplicated cases these features as a rule are not present.

The clinical picture is essentially that of cellular overhydration in Bull's classification of the uræmias, which was discussed in these columns on June 25, 1955. Bull described how water retention causes expansion of tissue fluids with lowering of their electrolyte levels, which leads to osmotic diffusion of excessive water into the cells. Bull did not mention premenstrual oedema, but his exhaustive list of the mechanisms of water retention offers two possible ways in which this condition can be initiated physiologically: reduced renal circulation, or increased production of water from catabolism of fat. If we still follow Bull, once some cellular overhydration is established, further water retention can occur because of oliguria due to swelling of the renal cells. Jacobsen has a different explanation, based on analogy with *diabetes insipidus* and its control by posterior pituitary lobe hormone; he considers that premenstrual oedema is caused by excessive reabsorption of water by the tubules because of increased secretion of antidiuretic factor by the pituitary gland. The oedema, together with its concomitant effects, builds up over some three to seven days, and then clears, spontaneously and rapidly, with diuresis, loss of the recently gained weight and relief of the accompanying symptoms.

Bull states that the clinical picture due to cellular overhydration is characterized by anorexia, nausea, vomiting, lassitude, stupor and confusion, changes of mood, coma, epileptiform convulsions and muscle cramps. Jacobsen mentions the throbbing headache with a feeling of pressure within the head, and states that nausea and vomiting are easily provoked, especially in women with a migrainous background. Greene<sup>2</sup> states that of 87 patients five suffered from epileptic fits, one from vertigo, ten from migraine, and 26 from severe headache, within the duration of the premenstrual syndrome. Apart from this series, several women were seen who suffered from premenstrual *petit mal*. He quotes instances of psychiatric disturbances; he emphasizes "that state of intolerable nervous tension or blackest depression which has broken up so many homes", and "irritation which they may fail to control". Jacobsen mentions "the nervous disturbance that may be the most conspicuous symptom to the rest of the family". These middle grades of disturbance are the commonest, and the most important because they are responsible for so much unnecessary family unhappiness and disruption. To the smaller group of the extreme manifestations of the syndrome belong the more severe grades of premenstrual depression leading to suicide, and the deterioration in character evidenced by French statistics showing that 84% of crimes of violence by women are committed during or immediately before the menses, and by another estimate that of crimes of violence 62% were committed during the premenstrual week, 19% at ovulation time, 17% during menstruation time, but only 2% during the week following menstruation. Quite common are associated exacerbations of acne, seborrheic dermatitis or eczema, or the cyclic occurrence of styes, ulcers of the mouth, sinusitis and vacuum headaches, or asthma.

Dalton emphasizes that often a three-month calendar must be kept before a positive diagnosis of premenstrual syndrome can be made, largely because of possible variations in timing. She instances the case of a girl who suffered from asthmatic attacks on some Mondays, never close to her menses; a calendar record showed a com-

pletely regular cycle commencing on every fourth Tuesday, and the asthmatic attacks occurred on the thirteenth day, which was always a Monday, and coincided with ovulation.

While most women suffer from the syndrome in noticeable degrees only between the ages of thirty and fifty, it may commence at puberty and continue undiminished after the menopause. Hysterectomy does not bring about its disappearance. Normally it disappears during pregnancy; on the other hand, the development of toxæmia during pregnancy often marks the first appearance of the condition, or causes its return, perhaps with increased intensity. It is in these patients that hypertension and albuminuria, with more than average oedema, appear thereafter in the premenstrual syndrome. All the evidence points to an increase in the oestradiol-progesterone ratio as the initiator of the water retention, and it is an observed fact that the exhibition of progesterone prevents its development. The three authors mentioned here have varying approaches to the details of treatment, mainly because of their differing conceptions of the cause.

There are three possible ways to treat this syndrome: (i) give progesterone before or early in its development, to arrest its development, (ii) give diuretics once the oedema has developed, to cure it, or (iii) give sedatives, to palliate it. When it is put that way, the answer becomes obvious; by having a calendar record kept the starting point in the cycle can be determined, and then progesterone may be given intramuscularly each day or second day, or anhydro-oxy-progesterone may be given by mouth daily, or progesterone implanted subcutaneously. It has to be remembered, of course, that progesterone is very expensive and therefore dosage should be kept as low as is compatible with efficiency. If the condition is already established when the patient is first seen, urea, ammonium chloride, "Mersalyl", and low-sodium, glucose-rich diets (to avoid potassium depletion) can be administered according to the severity of the case. Sedatives may be necessary at times, but there can be no excuse for substituting them for rational treatment.

A final point has been raised by Jacobsen. A woman with a mild degree of hypothyroidism may suffer from a much exaggerated degree of water retention during the premenstrual syndrome, with dilution of her normally elevated blood cholesterol content, but no improvement in her low basal metabolic rate; confusion in diagnosis may result. A woman with a mild degree of uncompensated heart disease may be unduly distressed by premenstrual oedema, and if seen at this stage she may give an entirely false impression of the gravity of her condition; alternatively, relief from recurring stress may vast improve her cardiac condition. Stilbæstrol given for endometriosis may so enhance the severity of the premenstrual syndrome as to put an even heavier burden on the patient.

#### B.C.G. VACCINATION FOR LEPROSY.

It is now agreed that B.C.G. vaccination may confer some slight immunity against leprosy, although many observers discount the significance of the reversal of a negative result of the Mitsuda test by B.C.G. vaccination. However, any prophylactic measure that can be developed against leprosy would be so widely beneficial that the Research Council of the South Pacific Commission has approved an experiment, undertaken by the Government of New Caledonia, to test the results of B.C.G. vaccination of the population of the Loyalty Islands. A preliminary report on the experiment has been presented by Dr. Lacour, Director of the Pasteur Institute of Noumea. Mantoux and Mitsuda tests have been performed, and the vaccinations carried out; later the tests will be repeated, and the vaccinations will be reinforced when necessary. This is, of course, a long-term project, of which the results, as reflected in the incidence of leprosy, can be assessed only after many years. It is to be hoped that success will attend the venture.

<sup>1</sup> Proc. Roy. Soc. Med., May, 1955.



## Abstracts from Medical Literature.

### MEDICINE.

#### The Site of the Mantoux Test.

J. GULD (*Acta tuberc. scandinav.*, Volume XXX, Fasciculi 1 and 2, 1954), in a study carried out to determine the effect of variation of the test site on the size of the tuberculin reaction, found that the reactions at each site were of the same average size. It appears to follow that valid comparisons may be made between tests made at different sites.

#### Oesophageal Diverticulum.

E. D. PALMER (*Am. J. M. Sc.*, January, 1955) found that of 33 patients with oesophageal or hypopharyngeal diverticula only nine had resulting symptoms and only four required surgical treatment, two because of undernutrition and two because of chronic pulmonary infection. On the other hand symptomless diverticula interfered with diagnostic and therapeutic procedures in several patients, especially in some with gastrointestinal hemorrhage.

#### Fluorohydrocortisone and Chlorohydrocortisone.

A. GOLDFIEN *et alii* (*New England J. Med.*, March 17, 1955) report their experiences with fluorohydrocortisone and chlorohydrocortisone. They state that the insertion of a chlorine or fluorine atom at the 9- $\alpha$  position of hydrocortisone greatly potentiates both the metabolic activity and the duration of action of the parent compound. Both compounds have been used successfully as the sole maintenance therapy in Addison's disease. Satisfactory inhibition of the adrenal cortex has been achieved with daily doses of one or two milligrammes of fluorohydrocortisone given by mouth to normal subjects and to female patients with the adreno-genital syndrome.

#### Rauwolfia.

J. GENEST, L. ADAMKIEWICZ, R. ROBILARD and G. TREMBLAY (*Canad. M.A.J.*, April 1, 1955) discuss the clinical uses of rauwolfia and describe the results of treatment with this drug in 76 patients with arterial hypertension for periods varying between two and twelve months. Of the patients 74 had essential hypertension and two had malignant hypertension. Forty-seven received the pure alkaloid ("Serpasil") in dosage from 0.75 to 3.0 milligrammes per day; 13 received the purified extract ("Rauwiloid") in dosage from six to 16 milligrammes per day; 20 received the crude root extract ("Raudixin") in dosage from 150 to 450 milligrammes per day. After complete preliminary investigation in hospital, each patient had blood pressure readings recorded every hour from 7 a.m. to 9 p.m. under the same standard conditions. The ages of the patients varied from thirty to seventy years. The authors state that their findings are fairly similar to those of

others in terms of the relative frequency of side-effects and in the greater effectiveness of rauwolfia for patients with mild benign essential hypertension and for those labelled as "hyperreactors" or "borderline". The tense hypertensive patients with a highly strung and perfectionist personality and those whose condition has a marked emotional or psychosomatic component are good candidates for such a drug, provided their vascular disease is uncomplicated and not too advanced. It is noted that nine out of 11 failures in the 55 cases in which rauwolfia alone was given were associated with a history of cerebrovascular accident, or with arteriosclerotic benign hypertension with a wide differential blood pressure. No significant differences in the efficacy, or the frequency or intensity of the side effects could be detected between the whole root extract, the purified root extract and the pure alkaloid reserpine, which appears to be the only or the main active substance of the root extract. Better results are obtained in cases of severe essential hypertension if reserpine or a rauwolfia extract is combined, as a "background drug", with "Apresoline", hexamethonium or "Ansolylen"; it seems to diminish the "sharpness" of the side effects of the more potent drugs. Rauwolfia given to hypertensive patients for periods of as long as twelve to fifteen months has not shown any sign of toxicity. Once the effective dose is reached, any increase in dosage will not be followed by a further fall in blood pressure level. These new drugs, however, do not strike at the heart of the disease and are, at best, palliative. It is considered that most hypertensive subjects benefit greatly by a reduction in their blood pressure, as can be judged by disappearance of incapacitating symptoms, lessening of the retinal and papillary changes, decrease in heart size, and increased working capacity and well-being.

#### Biliary-Tract Disease.

R. M. ZOLLINGER, E. T. BOLES and G. B. CRAWFORD (*New England J. Med.*, February 10, 1955) discuss the diagnosis and management of biliary-tract disease. They base their comment upon certain principles that have proved satisfactory to them over the past six years. They state that the frequency of cholecystectomy today and the high prevalence of complications of biliary-tract disease found at the time of surgery justify an appraisal of the diagnostic criteria and the indications for operation in this disease. The accuracy of diagnosis in gall-bladder disease is very high with the use of cholecystography. The demonstration of calculi is effective, and non-visualization after proper confirmation is satisfactory in the selection of patients for surgery; other findings, however, such as poor filling, abnormal size and shape, and poor emptying, are not sufficient evidence of disease. The recommendation for operation of patients with silent gall-stones should be individualized, but is strongly urged in young and middle-aged patients. If gall-stones are found in association with symptomatic cardiac disease, pancreatitis or duodenal ulcer, cholecystectomy is indicated as a

general rule. Patients with acute cholecystitis should be admitted to hospital, hydrated and closely observed. If the clinical course is one of continued and sustained improvement, operation is deferred until the patient is fully ambulatory and taking a normal diet. However, if the patient fails to improve on conservative measures, suffers a flare-up after initial improvement or has increasingly severe manifestations, an emergency operation is indicated. The recovery of approximately twice as many common-duct calculi in patients over sixty years of age as in those under that age is compelling evidence for earlier surgery in gall-bladder disease. Pre-operative management of the jaundiced patient with emphasis on dietary preparation and replacement of blood-volume deficits is essential in ensuring a low mortality. In the technical performance of biliary-tract surgery, wide exposure, good lighting and adequate relaxation are essential requirements. A technique of cholecystectomy whereby a mesentery is developed on the upper medial aspect of the gall-bladder is briefly described by the authors.

#### Hydralazine ("Apresoline").

J. C. MULLER *et alii* (*J.A.M.A.*, March 12, 1955) discuss complications of hydralazine therapy. They state that hydralazine is used for the treatment of hypertension. Complications have been pancytopenia, acute psychoses, gastrointestinal bleeding and a collagen-like illness resembling acute rheumatoid arthritis. A condition resembling acute lupus erythematosus may arise. Seven patients are reported in whom this hydralazine reaction occurred. Fifty-three patients received hexamethonium chloride and hydralazine combined for four to twenty-three months. The daily dosage of hydralazine was 300 to 600 milligrammes. Withdrawal of hydralazine generally induced an improvement in health. Hexamethonium had no apparent ill effect. In one patient treated with hydralazine, fever, arthritis, pericarditis, pleurisy with effusion and the presence of L.E. cells were observed.

#### The Management of Myocardial Infarction.

J. R. BECKWITH, D. T. KERNODLE, A. E. LEHEW and J. E. WOOD (*Ann. Int. Med.*, December, 1954) state that the time-honoured treatment of acute myocardial infarction with the patient at complete bed-rest has been challenged recently, and evidence has been presented that many patients do at least as well if allowed to sit in a chair during their convalescence as they would if confined strictly to bed. In order to compare the bed-rest treatment with the chair treatment, alternate patients admitted to hospital with acute myocardial infarction were treated at rest strictly in bed, or in bed part of the day and in a chair by the bedside at intervals during the day. The series consisted of 80 consecutively admitted patients with acute myocardial infarction who had lived twenty-four hours or more. All patients were given an anticoagulant, and prothrombin time estimations were performed once or twice

daily. No patient was allowed out of bed until shock, if present, had been controlled or pain had almost disappeared. The "chair" patients were allowed to sit in a comfortable chair by the bedside for thirty minutes three times daily for three days, sixty minutes three times daily for three days, and ninety minutes three times daily for six days. Then they were allowed to get up at will until twenty-eight days had elapsed since the onset of the infarction. They were carefully assisted to the chair and back to bed. They were also allowed to use a bedside commode or, in several instances, to walk a few steps with assistance to the bathroom once daily. Those patients confined to bed were kept there for twenty-eight days and were not allowed to bathe, shave or feed themselves until the second week after the infarction. They were encouraged to flex and extend their feet frequently, and several were allowed to use a bedside commode once daily. In this series three of the "chair-treated" patients died, and six of the "bed-treated" patients died—a mortality of 7.7% and 14.7% respectively. The two groups were reasonably comparable as to age and severity of disease. Patients allowed up in the chair were much less apprehensive and less depressed, and they seemed to take an active interest in their recovery and to feel that they could look forward to a future of reasonable activity. When they were discharged from the hospital, rehabilitation was well in progress. This psychological advantage was enhanced by the fact that constipation and urinary disturbance were less troublesome. Muscle tone was better, and there was a more general sense of well-being. On the other hand, patients confined to bed-rest during treatment were frequently depressed, and when the four-week period of rest was completed, rehabilitation was just beginning. Little difference occurred in the incidence of heart failure, thromboembolism or arrhythmia which would point to any advantage or disadvantage for either method of management in these cases. Referring to a recent review which indicated that ventricular aneurysm was more apt to occur in patients who had inadequate bed-rest after acute myocardial infarction, the authors emphasize that the "chair-treated" patients in this series were not allowed early ambulation, but that they were allowed to rest in a chair rather than in a bed. They suggest that the danger of aneurysm might really be less in these individuals, since the cardiac work is less in individuals sitting quietly in a chair than in the same individuals lying in bed. The "chair" treatment apparently did no harm and seemed to be attended by psychological and physical benefits. The authors conclude that despite the relatively small series of patients reported, it appears safe to state that patients with myocardial infarction can be treated with daily episodes of rest in a chair after the disappearance of shock and pain.

#### Treatment of Hypertension with Reserpine with or without Hydralazine or Hexamethonium.

W. M. HUGHES, E. DENNIS and J. H. MEYER (*Am. J. M. Sc.*, February, 1955) analyse the results of out-patient management of hypertension with

reserpine alone and in combination with hydralazine or hexamethonium. Reserpine was used in combination with hydralazine in the treatment of 15 patients, 14 of whom had previously been treated with reserpine alone for two months or longer without becoming normotensive. Of these patients 13 obtained a significant reduction in blood pressure on combined therapy, and five became normotensive. Reserpine administered prior to the addition of hydralazine decreased the incidence and severity of side effects that are observed when hydralazine is used as the only therapeutic agent for the treatment of hypertension. Reserpine was used in combination with orally administered hexamethonium in the treatment of 32 patients, 27 of whom had previously been treated with reserpine alone for two months or longer without becoming normotensive; 27 were responsive to combined therapy, and 15 became normotensive. When reserpine was used concurrently with hexamethonium, the dosage requirement of hexamethonium was reduced significantly, and the blood pressure response was more stable in comparison with the use of hexamethonium alone in the treatment of hypertension. The severity of side reactions was also reduced by use of a combination of reserpine and hexamethonium as compared with hexamethonium alone, because of a smaller dosage requirement of hexamethonium and a more stable blood pressure response. Observations on renal haemodynamics indicated that glomerular filtration and renal blood flow were not increased despite a significant and maintained reduction in blood pressure with any of the three therapeutic programmes studied—reserpine alone or reserpine in combination with hydralazine or with hexamethonium. This indicates that the improvement in the clinical status of these patients was probably not due to increased renal blood flow or to improved renal function, but was probably a direct result of blood pressure reduction.

#### Prognosis of Ulcerative Colitis.

F. C. WHELOCK and R. WARREN (*New England J. Med.*, March 17, 1955) present a follow-up study of 483 patients with ulcerative colitis seen at the Massachusetts General Hospital before 1943. Of 343 patients followed for ten or more years or to death, 232 (48%) were eventually operated on for ulcerative colitis. Over half the patients who were operated on or died without operation did so within the first three years. With most patients living after ten years the condition was under control whether treated with operation or without. Carcinoma of the colon developed in 31 patients, of whom 24 are dead and seven alive, two for more than five years, after operation. Intestinal obstruction is an appreciable hazard after surgery for ulcerative colitis, but usually occurs within a year of the operation. Improved non-operative therapy has prolonged the time between onset of the disease and surgery and has made operation safer when it is necessary. With the increased survival of patients with colons involved in ulcerative colitis, more cases of carcinoma are being discovered. In any patient with a definite diagnosis of

established chronic ulcerative colitis at the end of three years of treatment, colectomy and ileostomy should be recommended. Patients who prefer the risk of cancer to the handicap of ileostomy should receive barium-enema and sigmoidoscopic study twice a year as long as the colon remains and regardless of symptoms.

#### "Diamox."

J. R. PEARSON *et alii* (*J.A.M.A.*, January 22, 1955) report agranulocytosis following "Diamox" therapy. This drug is 2-acetylaminio 1,3,4, thiadiazole-5-sulphonamide. It is an orally administered diuretic recently introduced. The case is reported of a woman of sixty-six years who had been treated with 250 milligrammes of "Diamox" daily for cardiac oedema. Her temperature rose to 103° F. No cause was found except agranulocytosis. There was marked depression of bone marrow activity. The clinical picture was similar to that caused by aminopyrine, phenylbutazone, chloramphenicol, thiouracil and the like, pyribenzamine, mercurial diuretics, barbiturates, anticonvulsants, streptomycin and broad-spectrum antibiotics, and even cortisone. In the case reported large doses of penicillin-streptomycin mixture were given daily by the intramuscular route to prevent bacterial infection, and ACTH, 40 milligrammes daily by the intramuscular route, for the first four days, to endeavour to stimulate marrow recovery. The patient recovered completely.

#### Coronary Atherosclerosis.

D. M. SPAIN, V. A. BRADESS and I. J. GREENBLATT (*Am. J. M. Sc.*, March, 1955) report on the correlation of serum lipoproteins and somatotypes with post-mortem examination of the coronary vascular tree in 157 individuals who had died suddenly from violence or natural causes. They state that there was an overall correlation of over 80% of serum  $\beta$ -lipoprotein pattern and the degree of aortic and coronary atherosclerosis. This correlation is highly significant. The ectomorphic male proved to be an exception, in that there was 60% positive correlation, whereas in the other groups exclusive of the ectomorphs there was a 90% to 92% correlation. These findings confirm the greater degree of atherosclerosis in the mesomorphic male as compared with the ectomorphic male.

#### Cholecystectomy in Adams-Stokes Disease.

G. A. McLEMORE and S. A. LEVINE (*Am. J. M. Sc.*, April, 1955) report seven cases of cholelithiasis and Adams-Stokes syndrome. After cholecystectomy, the incidence of attacks of syncope was decidedly decreased during the post-operative follow-up period, which extended from six months to twelve years. In four cases the improvement was very striking. The authors state that it would appear that the removal of a diseased gall-bladder may not only relieve the patient of biliary symptoms, but improve the cardiac status in selected patients with complete heart block who have attacks of Adams-Stokes syncope.

## Special Articles for the Clinician.

### CXII.

#### CÆSAREAN SECTION: INDICATIONS.

(CONTRIBUTED BY REQUEST.)

A STUDY of the statistics of all obstetric hospitals shows that the indications for and the frequency of Cæsarean section have greatly increased during the last quarter of a century. At the Royal Women's Hospital, Melbourne, twenty-five years ago there were 3500 deliveries with 31 Cæsarean sections performed; last year there were 7000 deliveries, and these included 250 Cæsarean sections. This increase is due to a change in the indications for and contra-indications to the operation, the general adoption of the lower uterine segment operation, improvement in anaesthesia and blood transfusion services, and the discovery of the antibiotics. The maternal death rate associated with the operation twenty-five years ago was in the region of 8%; now it is less than 1%.

#### Indications.

The indications for the operation are today very numerous. I propose to use the statistics of the Royal Women's Hospital to indicate the relative frequency of each indication. To do this I have analysed all the Cæsarean sections performed at the hospital during the last three years. Six hundred and sixty-five patients were delivered by this method—459 for the first time and 206 at repeat operations.

#### Cephalo-Pelvic Disproportion.

Cephalo-pelvic disproportion was the commonest indication for Cæsarean section in the series. There were 118 patients who had cephalo-pelvic disproportion as the indication for the first operation, and in 108 repeat operations this had been the original indication.

An operation of election performed near term is the recommended treatment when there is a major degree of pelvic contraction and when previous Cæsarean section has been performed for cephalo-pelvic disproportion. In these cases "once a Cæsarean always a Cæsarean" still holds true.

The exact place of Cæsarean section in the management of an intermediate degree of pelvic contraction is controversial. Our method of treatment in such cases is a trial of labour.

An obstetrician has many problems when he is conducting a trial of labour. For the trial to be successful the maximum diameter of the head must pass the smallest diameter of the maternal pelvis; and until the head reaches this station in the pelvis, the question for how long the trial should proceed remains open. If there is progress, the answer is easy, namely, "Continue". If there is no progress, it is in most cases safe to wait until the membranes rupture. Thereafter four factors must be considered: the strength of the uterine contractions, the dilatation of the cervix, the general condition of the patient and the fetal heart rate.

**Uterine Contractions.**—With the membranes ruptured and good contractions, definite progress should be observed within four hours. With fair or poor contractions, progress should be observed within eight hours.

**Dilatation of the Cervix.**—With good contractions and the cervix fully dilated, it is safe to wait two hours with no progress; with the cervix not fully dilated, four hours may pass.

**General Condition of the Mother.**—The physical and mental state of the mother must be taken into consideration. If the patient becomes exhausted despite prophylactic treatment including intravenous therapy, it is time to end the trial. In most cases, after twenty-four hours of good labour a careful review should be made.

**Fœtal Heart Rate.**—When there is evidence of slowing of the fetal heart, indicating fetal distress, and if the cervix is not fully dilated or an easy forceps delivery is not possible, it is safer (for the baby) to perform an immediate Cæsarean section.

The obstetrician will decide that the trial has failed, having considered the above factors in conjunction with the observations that there is no progress and that the head has failed to reach the desired station in the pelvis. Cæsarean section is then the method of delivery, and under these conditions it is usually a safe procedure for the mother and baby.

The morbidity following Cæsarean section after a failed trial of labour is much less than if, in similar circumstances,

a difficult forceps extraction has been the method of delivery. When Cæsarean section is used, there are the immediate operative risks and the danger of uterine rupture in a subsequent pregnancy, but recovery is usually complete; whereas after a difficult forceps delivery (mid-cavity or high forceps) the following sequelae are often found: chronic backache, sphincter weakness and genital prolapse.

In most patients with intermediate degrees of cephalo-pelvic disproportion the end result is a spontaneous delivery or an easy forceps delivery. It should not be the aim to achieve a vaginal delivery at all costs, the labour being made a test of the patient's endurance, but, on the other hand, elective Cæsarean section should not be undertaken except in the most severe types of cephalo-pelvic disproportion.

#### Placenta Prævia.

Cæsarean section for *placenta prævia* is nearly as common as for cephalo-pelvic disproportion. One hundred and four patients were treated in this way. In this review, 61% of patients having a *placenta prævia* underwent Cæsarean section. The routine management of *placenta prævia* is in the first place conservative. This line is adopted in an endeavour to allow the pregnancy to continue and so reduce the fetal wastage due to prematurity. This conservative policy can be carried out because blood for transfusion is readily available and, with the availability of beds, the patient can remain in hospital. If one of the following criteria is satisfied, more active treatment is instituted. Active treatment is carried out (a) in patients admitted after the thirty-seventh week of gestation with an ante-partum hæmorrhage, (b) in patients at any period of gestation when the initial bleeding is severe (over one pint) and continued or repeated severe or moderate hæmorrhages (over ten ounces) occur, (c) in patients under observation who have reached the thirty-seventh week of gestation and who have any further hæmorrhage.

Active treatment consists of replacing the blood lost and performing a pelvic examination in the theatre with the patient anaesthetized. This examination will reveal whether *placenta prævia* is present and, if so, what type it is (namely, type 1, 2, 3 or 4).

Management then is as follows: (i) If the patient is not in labour: for types 2, 3 or 4, Cæsarean section is indicated; for type 1, conservative treatment is indicated. It is rare to find a type 1 *placenta prævia* causing bleeding with the patient not in labour. (ii) If the patient is in labour: for type 3 or 4, Cæsarean section is indicated; for type 1 or 2, artificial rupture of the membranes and application of a tight abdominal binder are indicated.

There were no maternal deaths in this group. In the 104 cases in which treatment was by Cæsarean section there was a fetal wastage of 19 (18%). In all cases of *placenta prævia* the fetal wastage was 35 (20%). This figure is regarded as being too high. In cases in which a previous Cæsarean section has been performed for *placenta prævia*, patients at subsequent pregnancies are usually delivered vaginally after a trial of labour, provided that there are no contraindications to this. This is shown by the small number (16) of repeat Cæsarean sections for which *placenta prævia* was the original indication.

#### Pre-Eclampsia.

There is a considerable difference of opinion concerning the place of Cæsarean section in the treatment of pre-eclampsia. As far as eclampsia is concerned, there is at present little controversy, for most obstetricians are agreed that Cæsarean section has practically no place in its management.

At the Royal Women's Hospital, in the last three years there have been 72 cases of eclampsia, and in only four were the patients delivered by Cæsarean section. None of these four cases occurred in the last twelve months. Thirty-one patients were delivered by Cæsarean section for pre-eclampsia, and in these there was deterioration despite accepted treatment. We regard a patient as having severe pre-eclampsia when the systolic blood pressure is over 160 millimetres of mercury and when the urine contains more than six grammes of albumin per litre of urine (Esbach) (half-solid on boiling). With the use of hypotensive drugs it is considered that most severe pre-eclamptic patients can be "carried on" with their blood pressure reduced until they are delivered vaginally, labour being induced by artificial rupture of the membranes. I have used this method over the last three years and so far have achieved a vaginal delivery in all cases. The immediate maternal results are better than when Cæsarean section has been performed, and the fetal results are equally as good. The late prognosis for the mother is much better in those cases in which a



vaginal delivery has been achieved. Another disadvantage of delivery by Cæsarean section is that if in subsequent pregnancies the toxæmia recurs, regardless of its severity, delivery may, of necessity, be by Cæsarean section, as induction of labour by artificial rupture of the membranes is most undesirable. In this series there were 21 patients who had a repeat Cæsarean section, the initial indication being pre-eclampsia.

#### *Prolapse of the Cord.*

When the cord prolapses and is still pulsating, the child must be delivered immediately. If the cervix is fully dilated and a vaginal delivery possible, this must be effected forthwith. If such is not the case, an immediate Cæsarean section is the best treatment. Whilst preparations are made for this a hand in the vagina will usually keep the presenting part from pressing on the cord. Twenty-seven patients were treated by this method and all had live babies. Provided that the indication does not recur, in subsequent pregnancies the patients are usually delivered vaginally.

#### *Failure to Come Into Labour After Artificial Rupture of the Membranes.*

Twenty patients had a Cæsarean section because they did not come into labour for periods varying from one to seven days after the membranes had been artificially ruptured. The indications for artificial rupture of the membranes were varied—the common one was pre-eclampsia. Many factors are taken into consideration in deciding how long to wait after artificial rupture of the membranes when there is no sign of the onset of labour. In all cases prophylactic treatment against infection is given. About 10% of all patients at the Royal Women's Hospital who have an artificial rupture of the membranes for pre-eclampsia or hypertension in pregnancy fail to come into labour within forty-eight hours. This includes those whose pregnancy has just reached the period of viability (twenty-eight weeks). Other factors to be taken into consideration are the age of the patient, number of babies, past obstetrical history, blood pressure early in pregnancy, past medical history *et cetera*. When these are considered, Cæsarean section may be the safest method of delivery for the baby.

#### *Transverse Lie.*

If the lie cannot be corrected before labour begins, a Cæsarean section of election should be performed. If it can be corrected but tends to recur, the onset of labour should be awaited and then the lie corrected and maintained until the presenting part enters the pelvis. In most cases this will be successful; if it is not, Cæsarean section should be performed, provided that the baby is alive.

A transverse lie, which is first diagnosed when the patient is in labour, in a *primigravida* with the fetus still alive should be treated by Cæsarean section—in a *multigravida* similarly, provided the cervix is not fully dilated. However, if in the latter case the cervix is fully dilated, internal version followed by breech extraction under deep anaesthesia is the method of choice, provided a preceding delivered child was of average size. If the baby is dead, a destructive operation achieves in most cases a vaginal delivery.

There were 19 cases with a transverse lie in which treatment was by Cæsarean section over the three years under review.

#### *Diabetes.*

Eighteen patients were delivered by Cæsarean section in the three years. It is of interest that 14 of these were delivered in the last twelve months, a fact which indicates the increasing use of Cæsarean section in the treatment of the pregnant diabetic. For any success in treating these patients, team work is essential between the physician and the obstetrician. The pregnancy should be terminated at or about the thirty-sixth week. For *primigravida*, Cæsarean section is the method of choice; for *multigravida*, surgical induction of labour by artificial rupture of the membranes is used unless this is contraindicated by the past obstetrical history, and then Cæsarean section should be performed.

The foetal results obtained with these methods are much more satisfactory than those obtained when the pregnancy proceeds to term and labour begins spontaneously.

#### *Abnormal Uterine Action.*

Eighteen patients were delivered by Cæsarean section after an unsatisfactory labour due to abnormal uterine action. It is also very likely that some patients who were regarded as having cephalo-pelvic disproportion really had abnormal uterine action. The effect on the mother's mental attitude

to labour and the inquiries from the relatives are the reasons for the higher incidence of Cæsarean section for this indication in private practice. Subsequent pregnancies should be treated on their merits. In this series there were eight repeat Cæsarean sections for this condition.

#### *Essential Hypertension.*

Thirteen patients underwent Cæsarean section for which the primary indication was essential hypertension. It is probable either that many of the patients were elderly *primigravida* (this combination is not uncommon) or that the baby was a "valuable" one. If patients with essential hypertension who have started their pregnancy with a systolic blood pressure of 160 millimetres of mercury or above reach the thirty-seventh week, then I think the pregnancy should be terminated at this stage. With *primigravida* two courses are open: the one is Cæsarean section of election and the other is artificial rupture of the membranes after waiting forty-eight hours only for the onset of good labour. With *multigravida* artificial rupture of membranes will usually bring the patient into labour.

#### *Previous Vaginal Repair.*

Twelve patients who had had a vaginal repair became pregnant and were delivered by Cæsarean section. There are many schools of thought as to the best method of delivery in such cases. According to one view vaginal delivery with an adequate episiotomy, forceps being used when necessary, is the method of choice. The opposite view is taken by those who prefer delivery in all cases by Cæsarean section. We take a middle course, and in the three years under review about one-third of the patients who had had a previous repair were delivered by Cæsarean section. Our decision depends to quite an extent on whether the patient had stress incontinence prior to the repair. If this was present and has been cured, a Cæsarean section is usually performed.

Four patients had a repeat Cæsarean section with a previous vaginal repair as the original indication.

#### *Brow Presentation.*

Brow presentation is uncommon. Treatment depends on whether this presentation is transient or fixed. If it is transient, no treatment is required. When it is fixed, we are dealing with an obstructed labour. Cæsarean section has a place in the treatment under these conditions. If the cervix is not fully dilated, Cæsarean section should be used in both *primigravida* and *multigravida*. Even if the cervix is fully dilated in a *primigravida*, a Cæsarean section is indicated unless the baby is very premature and the head is engaged. In a *multigravida* with a fully dilated cervix a vaginal delivery should be possible, provided the baby does not appear to be larger than one previously delivered.

Eleven patients had a brow presentation and were delivered by Cæsarean section in this series. In four cases a repeat Cæsarean section was performed with this as the initial indication.

#### *Breech Presentation.*

A breech presentation *per se* is rarely an indication for an elective Cæsarean section unless there is a past history of stillbirth due to a difficult delivery. The indication would, however, be strengthened if there was some coexisting factor, as when the patient is an elderly *primigravida*, a minor or intermediate degree of pelvic contraction is present or surgical induction of labour is necessary. In such cases opinion varies, some obstetricians preferring to deliver the patient vaginally, others favouring Cæsarean section. This depends a great deal on the skill of the obstetrician; there is no doubt that a difficult breech delivery requires more skill than a Cæsarean section. Nine patients with a breech presentation were delivered by Cæsarean section during the three years; this shows how infrequently this indication is the primary one.

#### *Placental Insufficiency.*

Placental insufficiency has recently become an occasional indication for Cæsarean section. Eight cases were included in this category, and they all occurred in the latter half of the period under review. Placental insufficiency may occur at any time during pregnancy; it is commonest, however, after the fortieth week of gestation. Diagnosis is difficult, and usually cannot be confirmed until the liquor is seen or the baby is born. The diagnosis is suggested by the following points: an inexplicable failure of the patient to gain weight

or a progressive fall in her weight, a decrease in the amount of liquor as shown by dropping of the height of the fundus or a reduction in the girth, and a decrease in the strength and frequency of the fetal movements. It must be stressed again that this syndrome can occur before term and is not limited to patients with prolonged gestation. Induction in these circumstances is warranted, as fetal death *in utero* or in labour is very likely to occur. If it is decided to induce labour, the membranes should be ruptured. Clear liquor indicates that the diagnosis has been incorrect or that the insufficiency is only mild; in either case the patient will in most cases come rapidly into labour, and no harm is done. If, when the membranes are ruptured, the liquor is thick and dirty, the diagnosis is correct. A Caesarean section should be performed at once, as these patients usually take a long time to come into labour; and when they do, the baby tends to die before it is delivered.

In the eight cases in which the mother was delivered by Caesarean section, all the babies survived.

If a Caesarean section has been performed for this indication, the method of treatment in subsequent pregnancies is as follows: if placental insufficiency is again present, an elective Caesarean section is performed; if it is not present, a trial of labour should be conducted.

#### *Fibromyomata.*

Caesarean section is rarely used as a method of delivery of patients with fibromyomata. Cervical fibroid tumours which cause obstruction during labour are the type which usually calls for operative interference. Elective operations are rarely performed, and the decision to operate is made when it is obvious that obstruction has taken place. Six patients fell into this category. A fibroid tumour in the lower segment may be the primary factor in producing a transverse lie and so lead to the need for a Caesarean section, because it will be impossible to turn the baby to a longitudinal lie. This type of fibroid is often not found until one has embarked on the operation.

#### *Previous Dystocia.*

Six patients were delivered by an elective Caesarean section because of a past history of a difficult labour and loss of the fetus. These patients had had their previous labours in another country, and there was no means of finding out the cause of the difficult labour and fetal loss. When records are available, the indication for the Caesarean section in this group of *multigravidae* should fall into one or other of the categories discussed.

#### *Intractable Vomiting of Late Pregnancy.*

It is fortunate that intractable vomiting of late pregnancy is rare, for it can rapidly bring about a serious deterioration in the patient. When we are sure that the vomiting is not due to any medical condition, the pregnancy should be terminated quickly. I prefer Caesarean section to artificial rupture of the membranes in these cases, as delay may mean loss of the patient's life. Six patients had a Caesarean section for this condition.

#### *Previous Hysterotomy.*

Five patients who had had a previous hysterotomy were subsequently delivered by Caesarean section. As the hysterotomy incision is usually in the upper segment of the uterus, it is often stated that in all subsequent pregnancies the patient should be delivered by Caesarean section. We take the view that if the hysterotomy was performed towards the beginning of the second trimester, it is safe to effect delivery by the vaginal route. If the hysterotomy was performed towards the end of the second trimester, a Caesarean section should be performed. In the former instance the uterine wound will have been small, and healing will have taken place with a minimal amount of scarring; whereas in the latter more extensive changes in the uterine wall will have occurred. The commonest indication for the original operation of hysterotomy was *hydridiform mole*.

#### *Failed Forceps.*

In the majority of cases of "failed forceps" in which the patients are admitted to the hospital, they are treated conservatively, and a vaginal delivery is achieved. This is due to the fact that the forceps were originally applied before the essential conditions were present for their correct application and the delivery of the baby. In only five cases was a Caesarean section necessary to deliver the child, and in these true cephalo-pelvic disproportion was present. This group does not include those who had a Caesarean section

after a "trial of forceps". In these circumstances forceps are tentatively applied in the theatre; if after a cautious application or pull the obstetrician decides that it will be a difficult delivery, Caesarean section is proceeded to without delay.

#### *Miscellaneous Indications.*

Twenty-three patients were delivered by Caesarean section for indications not already mentioned. These were previously ruptured uterus, previous subarachnoid haemorrhage in labour, chronic nephritis, previous operation for subseptate uterus, carcinoma of the cervix, ovarian cyst, subacute pancreatitis, rupture of the uterus, tuberculous meningitis, cerebral haemorrhage, pregnancy in elderly *primigravidae*, death of the mother necessitating post-mortem Caesarean section, accidental haemorrhage, eclampsia and face presentation of the fetus. The number of patients who had a Caesarean section for any one of these indications was four or less; in most instances it was only one.

Five patients had a repeat operation, and the original indication is not included in the lists above. Again the numbers involved are very small. The original indications were as follows: vaginal stenosis, tubal implantation, vesico-vaginal fistula, imperforate anus, previous myomectomy.

#### *Previous Caesarean Section.*

When a patient has had a previous Caesarean section, many factors must be considered before a decision is made on whether the next baby will be delivered by a repeat Caesarean section or whether the vaginal route will be tried.

1. If the indications for the first Caesarean section are still present, a repeat Caesarean section is necessary. Cephalo-pelvic disproportion comes into this category provided the baby is more or less the size of the previous one and its attitude is the same.

2. If the indication for the first Caesarean section is not present, a repeat Caesarean section should be performed if (a) the previous Caesarean section was a classical one (there is probably a weak uterine scar) or (b) the post-operative period was stormy or the abdominal wound was infected (again there is possibly a weak scar).

3. If it is proposed to allow the patient to attempt to deliver herself vaginally, the subsequent labour should be conducted as a "trial of labour". The danger of the latter is rupture of the uterus; no patient who has had a previous Caesarean section should be delivered in a hospital where a Caesarean section cannot be carried out should it be necessary.

In this period 297 patients with a history of previous Caesarean section were confined at the hospital; 206 patients had an elective Caesarean section, and with 91 patients a vaginal delivery was attempted. Of the patients who had a trial of labour 88 were delivered vaginally and three by Caesarean section. In the three cases in which patients were delivered by Caesarean section after a failed trial of labour, Caesarean section should have been performed as a procedure of election. In two cases the initial indication was cephalo-pelvic disproportion, and a repeat operation in these circumstances is the rule. The third patient was two weeks overdue, the membranes were ruptured, and she failed to come into labour within forty-eight hours. Patients with a history of a previous Caesarean section should not have their membranes ruptured to induce labour. If there is an obstetrical reason for induction, a repeat Caesarean section must be performed. In the group of those who had elective Caesarean sections there were four patients in whom the uterus had ruptured. In three a silent rupture of the uterus had occurred between the thirty-seventh and thirty-eighth weeks of pregnancy. All had had a previous classical operation and were not in labour. Two of the three babies were stillborn. In the fourth patient a small hole was found in the scar when an operation of election was being performed. The baby was not affected. None of the four patients with a ruptured uterus died.

The fetal wastage was nine for the elective operations and three for the trial of labour group. In the latter group, in two cases the babies were dead before labour began, and in the third the cord had prolapsed.

#### *Contraindications.*

There are some contraindications to Caesarean section.

#### *Eclampsia.*

In the period under review, only three of the 96 patients with eclampsia were delivered by Caesarean section and, in my opinion, these would have been better treated if labour

had been induced by artificial rupture of the membranes. The point against Caesarean section in the treatment of eclampsia is that it is accompanied by a high maternal mortality. This is not borne out by the figures in this series, as they are too small, but it is shown by the maternal mortality statistics for the State of Victoria.

#### Accidental Haemorrhage.

In the period under review there were 460 patients who had an accidental haemorrhage, and in 96 this was of the severe type. In the main these were treated by conservative measures and replacement of the blood lost. Five patients were treated by Caesarean section, and in all of them the pre-operative diagnosis was *placenta praevia*. Only one of these five had the severe type of accidental haemorrhage. We consider that Caesarean section is contraindicated in the treatment of this condition, despite its wide popularity in many obstetric centres.

#### Dead Baby.

Except in rare instances Caesarean section should be avoided if the baby is dead. Of the exceptions the most important is *placenta praevia* of types III and IV in which the haemorrhage is severe. It is a lifesaving measure in these cases. A Caesarean section is also justified when the pelvis is so contracted that it is impossible for the baby to be delivered by the vaginal route.

#### Monsters.

For monsters Caesarean section should be avoided unless there is a *placenta praevia* of type III or IV.

#### Choice of Operation.

There are four methods of performing a Caesarean section: (i) lower uterine segment operation, (ii) classical operation, (iii) extraperitoneal operation, (iv) hysterectomy.

The lower segment operation is today the operation of choice. The advantages of this operation over the classical one are as follows: less bleeding at operation, fewer post-operative complications, a better scar with less risk of rupture in a future pregnancy or labour, less risk of bowel adhesions, less chance of sepsis.

There is still a small place for the classical operation in modern obstetrics. The classical operation is indicated firstly when there is a transverse lie of the foetus which cannot be corrected, and secondly if there is a constriction ring. In these instances a vertical incision, half in the upper and half in the lower segment, can be used. The desirability of a rapid delivery should not be an indication for the classical operation.

The extraperitoneal operation was introduced when sepsis was a serious problem; this is not the case today, and the advantages it has in this regard are outweighed by the technical difficulties of the operation.

The operation of Caesarean section is essentially one in which teamwork is important. The team should consist of an obstetrician, an assistant, a skilled anaesthetist and a paediatrician. We are of the opinion that a paediatrician should carry out the resuscitation of the baby.

#### Results.

##### Maternal.

In this series of 665 cases there were four maternal deaths. In addition, there were two cases of post-mortem Caesarean section.

The four maternal deaths were due to the following causes. Two deaths followed operations performed for cephalo-pelvic disproportion and were due to an incompatible blood transfusion (one of these was due to direct incompatibility and the other to the presence of a rare type—an Hr type). Although neither of these deaths was primarily due to the operation, it is correct to assume that bleeding would have been less severe in a vaginal delivery, and transfusion would not have been necessary. The third death followed when, during Caesarean section for a brow presentation, mechanical respiration was in progress and the anaesthetic machine failed to supply oxygen; the patient became cyanosed, and cardiac arrest occurred. Cardiac massage was carried out, and the heart recommenced to beat. The patient survived for five days and died with bronchopneumonia. The fourth death occurred when the patient collapsed a day after the operation; the indication was severe pre-eclampsia superimposed on essential hypertension at the twenty-eighth week.

#### Fetal.

In the series of 459 first Caesarean sections there were eight sets of twins. There were 23 stillbirths and 46 neonatal deaths—a fetal wastage of 69, or 148 per 1000. In 206 repeat Caesarean sections there were nine neo-natal deaths—a fetal wastage of 43 per 1000.

#### Comment.

This survey of the results of Caesarean sections at the Royal Women's Hospital in the last three years shows that under the best conditions there is still a risk in the operation. A maternal mortality of a little under 1% is still much higher than for vaginal deliveries.

The fetal wastage in the repeat Caesarean sections of election was 43 per 100. This does not compare well with the overall fetal wastage for the hospital during the same period, namely, 27.3 per 1000 booked deliveries. There is no doubt that, all things being equal, it is safer for the baby to be delivered vaginally. Most of the nine neo-natal deaths were due to partial pulmonary atelectasis following on the development of hyaline membranes. Careful, thorough and early clearing of the naso-pharynx and stomach will lessen this complication; and since measures to do this have been used at Caesarean sections, the number of neo-natal deaths has been reduced.

#### Conclusion.

Caesarean section as a method of delivery is to be used in order to reduce the morbidity and mortality of mother and child and not as an easy way out of a difficult obstetrical problem. Which method of delivery should be chosen may require the most skilful and critical judgement on the part of the obstetrician. He should never consider his own difficulties; his only concern should be his patient and her baby.

LANCE TOWNSEND,  
Melbourne.

## Out of the Past.

*In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.*

### A SUCCESSFUL VOYAGE.<sup>1</sup>

[From "A Narrative of the Expedition to Botany Bay", by Watkin Tench, Captain of Marines.]

On the morning of the 20th (January, 1788) by ten o'clock, the whole of the fleet had cast anchor in Botany Bay, where, to our mutual satisfaction, we found the Governor and the first division of transports. On inquiry, we heard that the Supply had arrived on the 18th and the transports only the preceding day. Thus after a passage of exactly thirty three weeks from Portsmouth, we happily effected our arduous undertaking with such a train of unexampled blessings, as hardly ever attended a fleet in a like predicament. Of two hundred and twelve marines we lost only one: and of seven hundred and seventy five convicts, put on board in England, but twenty four perished in our route. To what cause are we to attribute this unhopd for success? I wish I could answer—to the liberal manner in which the Government supplied the expedition. But when the reader is told that some of the necessary articles allowed to ships on a common passage to the West Indies were withheld from us: that portable soup, wheat, and pickled vegetables, were not allowed: and that an inadequate quantity of essence of malt was the only antiscorbutic supplied, his surprise will redouble at the result of the voyage. For it must be remembered that the people thus sent out were not a ship's company starting with every advantage of health and good living which a state of freedom produces: but the major part a miserable set of convicts, emaciated from confinement, and in want of cloaths, and almost every convenience to render so long a passage tolerable. I beg leave however to say that the provisions served on board were good, and of a much superior quality to those usually supplied by contract. They were furnished by Messrs. Richards and Thorn of Tower Street London.

<sup>1</sup> From the original in the Mitchell Library, Sydney.





Once the actual cause of cancer has been discovered, it is conceivable that an antibiotic or some form of immunization may be found, as in the case of syphilis, smallpox *et cetera*;

TABLE IIIA.

Royal Prince Alfred Hospital, Sydney: Five-Year and Ten-Year Absolute Cure and Survival Rates of Carcinoma Cervicis Uteri: Adenocarcinoma, 1930-1949.<sup>1</sup>

Observation.	Five Years.	Ten Years.
All patients examined .. .. .	57	40
All patients treated .. .. .	56	40
Survival .. .. .	11	5
Dead of carcinoma .. .. .	46	35
Survival rate .. .. .	19.2%	12.5%

<sup>1</sup> Of 27 patients operated on, five showed lymph-gland involvement. No patient with adenocarcinoma treated with radium alone survived five years.

but until that time arrives we must use to the best advantage the known methods of successful treatment. At present we can make claim to steady progress and to the saving of more and more lives each year.

TABLE IIIB.

Royal Prince Alfred Hospital, Sydney: Five-Year and Ten-Year Absolute Cure and Survival Rates of Carcinoma Cervicis Uteri: Lymph Gland Involvement, 1930-1949.

Observation.	Five Years.	Ten Years.
Number of patients submitted to radical operation .. .. .	389	244
(a) Number found not to have gland involvement .. .. .	310	193
(b) Number found to have gland involvement .. .. .	79 (20.3%)	51 (20.9%)
Number alive in Group (a) .. .. .	202	101
Number alive in Group (b) .. .. .	26	10
Survival rate in Group (a) .. .. .	65.2%	52.3%
Survival rate in Group (b) .. .. .	32.9%	19.6%

As a staff we are convinced that patients with adenocarcinoma and with invaded lymphatic glands have a poorer chance of survival than patients with squamous malignant disease of the cervix without gland involvement.

The treatment of carcinoma of the corpus uteri, which we at King George V Hospital regard as mainly surgical, shows better and better results, for the same reasons as have been advanced for the improved results in our treatment of carcinoma of the cervix uteri.

We should again like to stress the importance of all patients suspected of suffering from uterine cancer being sent to centres where pathologists, physicians and trained specialist surgical teams exist, rather than being given piecemeal treatment by the general practitioner surgeon, however competent he is in the art of cutting.

If we are to make advances in our treatment of this disease, meticulous follow-up records are essential. In this

TABLE IV.

Royal Prince Alfred Hospital, Sydney: Carcinoma Cervicis Uteri, 1945-1949: Squamous Carcinoma and Adenocarcinoma Combined Figures: Five-Year Cure and Survival Rates, Compiled December, 1949.

Observation.	Five Years.
All patients examined with view to treatment .. .. .	289
All patients treated .. .. .	266
Alive without recurrence .. .. .	114
Alive with recurrence .. .. .	4
Dead of carcinoma .. .. .	136
Dead of intercurrent disease (under five years) .. .. .	5
Lost or not followed up .. .. .	7
Cure rate amongst all patients examined .. .. .	39.4%
Survival rate amongst all patients examined .. .. .	40.8%
Cure rate amongst all patients treated .. .. .	42.9%
Survival rate amongst all patients treated .. .. .	44.4%

regard the staff would like to thank Dr. Frank Pigott and Miss M. Cunningham for the hard work they have undertaken in providing the reliable statistics for the department.

Professor J. Heyman, of the *Radiumhemmet*, wrote and congratulated the King George V Hospital on the accuracy of its returns to the International Committee for Recording World Statistics on womb cancer.

Signed on behalf of the gynaecological staff of the King George V Memorial Hospital, Royal Prince Alfred Hospital.

HERBERT SCHLINK.

TABLE V.

Royal Prince Alfred Hospital, Sydney: Five-Year and Ten-Year Survival Rates of Carcinoma Corporis Uteri, 1930 to 1949.

Treatment.	Five-Year Survivals.						Ten-Year Survivals.					
	Number.	Alive.	Post-Operative Deaths.	Other Deaths.	Lost.	Survival Rate.	Number.	Alive.	Post-Operative Deaths.	Other Deaths.	Lost.	Survival Rate.
Application of radium and surgery, or surgery alone	136	94	2	35	5	69.1%	72	43	2	24	3	59.7%
Application of radium alone	31	4	3	23	1	12.9%	19	1	2	16	—	5.3%
Application of radium plus incomplete surgery or incomplete surgery alone	8	3	2	2	1	37.5%	4	1	2	1	—	25.0%
No treatment .. .. .	7	—	—	7	—	—	3	—	—	3	—	—
Total .. .. .	182	101	7	67	7	55.5%	98	45	6	44	3	45.9%

## Medical Societies.

### PÆDIATRIC SOCIETY OF VICTORIA.

A MEETING of the Pædiatric Society of Victoria was held at the Royal Melbourne Hospital on May 11, 1955.

#### Immunization Against Poliomyelitis.

DR. P. BAZELEY presented a paper on the subject of immunization against poliomyelitis.

DR. W. UPJOHN, Chairman of the Consultative Council on Poliomyelitis, introduced the speaker. In doing so he briefly

outlined the function of the Consultative Council and stated that it was a State body charged with giving advice to the Victorian Government on certain matters involved in the treatment of poliomyelitis, and also in providing treatment in all its forms, accommodation and transport, and perhaps as an after-thought to do what it could to prevent the spread of poliomyelitis. The last part was obviously most important, but up to the present had been the most difficult side of the work. It had long been realized that the solution of the problem might come with the use of widespread vaccination, as was in use with other diseases such as diphtheria; so it was with great interest that the council learnt that Dr. Bazeley, who had already obtained experience in tissue culture methods of growing poliomyelitis virus at the Commonwealth Serum Laboratories, had gone to America

to work with Dr. Salk on the production of a vaccine against poliomyelitis. Dr. Upjohn said that everybody would be extremely interested to hear first hand from Dr. Bazeley himself some of the details of how the vaccine was produced and used.

Dr. Bazeley thanked Dr. Upjohn for his introductory remarks and stated that he would discuss the development of what was now known as the "Salk vaccine"—first, the vaccine itself and some of its important structural elements, and second, what the vaccine would do on an experimental basis. Following that he would show, by figures taken from the field trial evaluation report, some of the results obtained during the very large field trial that had been carried out in the United States of America in 1954. The vaccine used in that trial had been produced partly in Pittsburgh and partly in other research laboratories in Toronto, and by several of the biological houses in the United States, such as Eli Lilly and Parke, Davis. He said that the vaccine was simply the best virus suspension obtained by tissue culture methods and then inactivated by formalin. Formalinization was carried to a point where there was no live virus left in the vaccine.

Previous experiments by other workers with immunization involving the use of vaccines had been a failure because insufficient antigen had been available from which to produce vaccine. The first real evidence that protection from infection could be secured by laboratory methods was obtained by Morgan and Howard at the Johns Hopkins Hospital, Baltimore, between 1945 and 1948, when they showed that a series of injections of vaccine prepared from formalinized infected monkey spinal cord would protect monkeys against direct challenge with fully virulent virus. They were unable to capitalize on that because of the large number of injections that had to be given and also because of the problem of securing sufficient virus from that particular source. The source, monkey nervous tissue, had a very poor record for reactivity when used in human subjects.

The real opening came, however, in 1949, when Dr. John Enders and his team developed the tissue culture method of growing the virus. That immediately opened up limitless possibilities for producing virus in constant and sufficient concentration to form a vaccine, and Dr. Bazeley said that many people including himself had realized immediately the great possibilities. Dr. Salk commenced work on the vaccine in Pittsburgh, and Dr. Bazeley had been fortunate enough to be able to work in association with him since 1952.

Dr. Bazeley did not discuss in detail all the early steps in the production of a successful vaccine, but talked mostly of the vaccine in use today. He described how development along two lines had led to its production in a potent and safe form. During the past three years the chief advance had been the increase of potency of the vaccine; that had been obtained by an increase in virus concentration in the fluid that was converted to vaccine. Much progress had also been made in preserving the antigen from damage and ensuring that it was completely inactivated.

Dr. Bazeley discussed the relationship of monkey tissue to the final vaccine and stated that one gramme of monkey kidney cortex provided approximately 125,000,000 epithelial cells. However, only about 1% of the cortex itself actually took part in the tissue culture, the rest of the tissue appearing to die or decay at a steady rate. Thus 625 millilitres of synthetic mixture, known as 199 of Morton and Parker, with one gramme of kidney cortex gave  $125 \times 10^6$  epithelial cells, and with 900 infective units per cell of type I, 280 of type II, and 180 of type III, the final trivalent vaccine contained  $10^{10}$  killed infective units per millilitre of type I,  $10^{7.5}$  of type II and  $10^{7.5}$  of type III. The yield of virus was related entirely to the number of cells present, and on an average each cell yielded about a constant amount of virus of the three types. Type I gave a more prolific yield than types II and III.

The vaccine was safety tested in a very adequate way. Large quantities of each batch were removed at the end of the inactivation period, dialyzed to remove formalin and then distributed over a large quantity of flasks containing very active tissue cultures. If any live virus was present, there was no question of the vaccine's being used.

Dr. Bazeley then showed a series of slides which demonstrated the performance of the vaccine by laboratory testing. The antibody rise after each of three doses of vaccine, one millilitre being given intramuscularly to 20 subjects with no pre-antibody to any type, was shown in graph form. There was a brisk rise over the four weeks during which the first two injections were given, with a lesser rise following the third injection. Another series of graphs showed the effect of repeated doses of vaccines on the antibody titre, and it

could be seen that after the first dose there was a marked rise; if the second dose was given too soon, there was no further rise, but the third dose brought the level up to a satisfactory one. Dr. Bazeley said that that was not an uncommon finding if the second dose was given too close to the first; therefore, three doses of vaccine were not now given, and in the field trial the middle dose had been eliminated. If the immunization was not less than seven months old or the subjects had acquired antibodies, the reaction to a repeated dose was rather different. A few days after the dose there was a very sharp rise in antibodies, tenfold or more. That was referred to as the booster effect, and graphs were shown to demonstrate the effect in people who had been immunized with vaccine or by natural infection. In both groups the response to the booster dose was similar.

The importance of the route of immunization was also demonstrated. In a series of 29 subjects the standard dose of one millilitre given intramuscularly produced a good response. Subcutaneous injection produced a slightly lower effect, but 0.1 millilitre given intradermally produced quite a reasonable antibody rise. That was an interesting finding, because it would become possible to make the vaccine go much further with that method, and it might also be possible to reduce the danger of the McCloskey effect during epidemic conditions.

Further graphs demonstrated what happened to the antibody rise following a single injection of vaccine or following natural infection. There was a steady fall in antibody, but a reasonable level was still present after thirty-two weeks. A single booster dose given then would cause the level to rise abruptly. If there had been prior antibody present in the subject, then a single dose of vaccine would produce a high level immediately. The antibody fall following injection did not continue as a straight line, but the level fell to approximately half that obtained initially and occupied a fluctuating level for a long time. In some cases the subjects had been observed for two years and still showed about half the initial level reached whether by booster effect or by primary immunization.

The maximum rise in antibody following a booster dose occurred three to nine days after injection, compared with the two to three weeks following primary inoculation.

Graphs were also shown comparing the antibody rise in human subjects with no pre-antibodies, different batches of vaccine being used, and showing the increased effectiveness of the vaccine in use today—the one referred to as vaccine A. It was also evident that antibody response to the type II virus was always the greatest and that to type I the lowest; type III occupied a position midway between.

Dr. Bazeley then showed a series of tables taken from the evaluation report of the field trials, which had been delivered by Dr. Thomas Francis at Ann Arbor on April 12, 1955. During the year of the trial there had been plenty of poliomyelitis about in the United States; the rate per 100,000 population in 1954 was 24.1 in the United States and an average of 28.9 in all the areas studied. That compared with the previous five-year average of 25.7 and 33.2 for the same areas. In all the data Dr. Bazeley referred particularly to the case rate per 100,000 subjects.

In the trial there were three groups. The first was a group known as the "placebo area" and made up of about 400,000 children; half of these received vaccine, and the other half received the same dose of the medium in which the vaccine was prepared. The children were all seven-year-olds and in the second grade, and they were given vaccine or placebo alternately. The second group was known as the "observed area"; it consisted of a further approximately 250,000 children who were given vaccine, and approximately 700,000 controls who were either not vaccinated or received one or two injections of placebo only. The vaccinated children were all second grade pupils, aged seven years, whilst the controls in the group were first and third grade, between six and eight years of age, and therefore not absolutely comparable. From an examination of the results, particularly the estimated case rate per 100,000 in the groups, it was seen that there was no difference between the number of non-paralytic cases in vaccinated, placebo or control groups. However, there was a statistically significant difference in the paralytic cases. The vaccinated group in the placebo area gave a case rate of 16 per 100,000, whilst those receiving placebo only showed a rate of 57. In the control group in the observed area the rate was 46, and in the vaccinated group 17 per 100,000. In the placebo area a third group used as controls were those who had none, one or two injections of placebo only, and the rate in that group was 36 per 100,000. The difference between the two groups of controls, 57 and 36 per 100,000, was tending on significance



and might have been due to a McCloskey effect, or to the fact that immunization was carried out in an epidemic period; some subjects might have been in a negative phase in which they were more susceptible to paralysis than if no vaccine had been given. Dr. Bazeley said that more evidence on that point would come out later when Dr. Francis published the complete report. However, it had been demonstrated in Pittsburgh with mice and monkeys that, if a challenge dose sufficient to produce 50% paralysis was given and then the animals were subjected to vaccine dosage on certain days, there was a point when with mice paralysis would develop in the next few days, or with monkeys in eight to ten days, and that paralysis was not related to the site of injection.

Further graphs were shown, which confirmed the field trial findings already mentioned, and Dr. Bazeley said that all the results showed that where the figures were large enough to be statistically significant, there was a striking difference between the case rate in the vaccinated group and that in those receiving placebo. The results also showed that the most satisfactory immunization was obtained against type II, just as was shown in the initial experiments with antigenicity. Type I immunization was the least effective, with type III about half-way between.

It was also shown that, with different batches of vaccine, the protection rate varied in accordance with which batch of vaccine had been demonstrated to have the greater antigenic power. From that it was considered that the information was sufficient to say that what was thought to be a good vaccine based on its known virus content initially showed up as a better immunizing substance than one known to be poor.

Dr. Bazeley then commented on the work taking place in America on modified virus vaccine. His own and Dr. Salk's view was that immunization should be achieved by a killed virus vaccine—in other words, one with no chance of producing paralysis. However, there was a great deal of work going on in the United States of America, Australia and elsewhere on modified attenuated virus vaccines. The general aim of that work was to produce a vaccine, usually by tissue culture methods, that was so reduced in pathogenicity that it could be used in human beings without risk of paralysis or risk of spreading the infection in the community. The best work so far was that of Dr. Sabin in Cincinnati. He used tissue culture methods and felt that by mass inoculation of cultures he was able to produce moderate variants after a number of passages, 50 to 55 in number. Those variants were solid genetically and would not produce paralysis in monkeys when given intracerebrally to the chimpanzee, or intraspinally to the cynomolgus monkey, although he was not able to abolish the intraspinal effect in the chimpanzee. He felt after considerable investigation that he had the three types to this degree of perfection and largely free of danger, and that the strains were fixed. Recently he had used the three strains with 30 prison inmates, and virus was given orally. In all cases in which the antibody status of the individual was low, the virus readily established itself in the pharynx for periods up to six weeks, and the alimentary canal appeared to be infected simultaneously and for a somewhat longer period of time, six to eight weeks, starting a few days after infection. Virus was manufactured in both places because large amounts were recovered from throat and faeces. The subjects showed a moderate rise in antibodies during the succeeding three to four weeks, after which the rise ceased and the level remained stationary.

In the cases in which virus was isolated from the faeces, there was a reversion to spinal pathogenicity in the cynomolgus monkey; also a more disturbing feature was that it did not seem possible to obtain immunity to the three types when they were fed simultaneously. In all cases type I preponderated when an infection occurred. The other types would have to be fed at a later date, six to eight weeks after one another, so a considerable period was necessary to achieve immunity. During that period there would be continuous faecal excretion. However, in the prison inmates there had been no cross-infection. A small number were given intramuscular injections of the same virus, and two of four became "positive" as regards faecal excretion. Lederle's laboratory had obtained similar results.

It would seem then that an approach to the problem would be to search for strains which were naturally non-pathogenic, if such things existed.

In conclusion, Dr. Bazeley said that he thought that there was sufficient evidence to show that killed vaccine was a tool that could be used, and there seemed at the moment no limit to its further development. It could now be made as strong as was necessary or as concentrated as necessary, and

the limit had not yet been reached of the way in which it could be used.

SIR MACFARLANE BURNET opened the discussion on Dr. Bazeley's paper and commented briefly on the history of the events which had made this work on the production of vaccine possible. He said that ten years previously many people had a good idea that vaccination was to be the desirable method of prevention of infection with poliomyelitis, but then the virus could be grown only in the nervous tissue of monkeys. The first important step therefore was the elimination of the long-held view that it was necessary for the virus to grow in the central nervous system tissue, and the next important step was the discovery, in 1949-1950 by Enders, of the method of producing virus in tissue culture. Also Dorothy Horstman and others had shown that there was a regular viraemia in poliomyelitis, and that the virus had to pass through the blood to reach the central nervous system.

Immediately the potentialities of those facts were realized by virologists, and many, with Dr. Salk in the forefront, began to elaborate Enders's work. When Sir Macfarlane Burnet visited America in 1952 there was a widely held view that the vaccine had only to be made to be successful. Dr. Salk wanted someone to take charge of pilot development work, and it was arranged for Dr. Bazeley to go to Dr. Salk. Sir Macfarlane Burnet said that the trials in 1954 had indicated that the vaccine, when properly made, was safe and effective, and he thought that that vaccine would remain for at least the next three to four years the standard method of immunization against poliomyelitis. He did not, however, feel absolutely confident that it would not be replaced by a still more effective vaccine, but Australia must now produce the Salk vaccine as rapidly as possible. They all owed Dr. Bazeley a great debt of gratitude. Sir Macfarlane Burnet concluded by saying that in a sense the present was an historic occasion. The past fifty to sixty years had seen the elimination of practically every other infectious disease as a major cause of death in young people, and it seemed as though the last of the infectious diseases was coming under control and they were seeing the end of what began as the Pasteurian revolution.

DR. J. COLEBATCH asked Dr. Bazeley if he could explain why the least effective immunization occurred against type I virus when that had the highest concentration of killed virus units per millilitre, and how that would affect the problem when it was realized that the most prevalent type in the 1953-1954 epidemic in Australia was type I.

Dr. Bazeley, in reply, said that it was a pertinent question and the story regarding type I was a complex one. As a pathogen, type I virus spread more rapidly through the tissues after infection—in other words, its invasiveness was more rapid—and that probably accounted for its higher incidence in the community. In the field trial, protection against type I was 60% to 70% only, which was by no means satisfactory, and that must be improved in future. However, more recent batches of vaccine had been made with a much better type I component.

DR. R. SOUTHEY asked what method of sterilization of needles and syringes had been used in the field trial which involved so many injections.

Dr. Bazeley said that about 650,000 children had received injections and the common method had been to use a syringe containing five to ten doses and to change needles. There had been no complications at all, so far as they knew, from using that technique.

DR. D. HICKS asked if there was any difference in the antibody response to natural infection with types I, II and III.

Dr. Bazeley said that there was the same order of difference as with the vaccine. Type I response was always rather lower.

DR. B. HALLAM asked whether there was an explanation for different figures obtained in placebo and control groups for the case rate in the field trial.

Dr. Bazeley said that in the trials about 200,000 children were given three doses of vaccine, about another 200,000 received three doses of placebo or the medium used in tissue culture, and a third group of about 200,000 received one or two placebo injections or none at all. The last-mentioned group was therefore used as an unofficial control group. There was a difference in rate in the latter two groups which only bordered on significance. If it was significant, two things could apply—firstly, the McCloskey effect, or secondly, that the individual had been observed during a susceptible period. At the moment no information was available about what proportion showed a relationship between site of injection and paralysis.

Dr. A. G. LIDDELOW asked how the vaccine was tested to see if the virus had been killed.

Dr. Bazeley said that the vaccine had to be tested in rather a different manner from that of a laboratory culture. About a 1% to 2% sample of each batch had to be used. First it was dialysed to remove formalin, then the large sample was transferred into tissue culture flasks, which were rocked so as to obtain adequate contact between the tissue cells and any virus present. After five days the flasks were sampled again and transferred to new tissue culture flasks. Three transfers might be necessary to make sure that any virus that had grown up slowly and was in the process of regeneration of activity would be picked up. The testing for the presence of any live virus occupied a major position in the production of vaccine.

Dr. J. F. FUNDER asked what the yield of vaccine would be from the original monkey tissue.

Dr. Bazeley said that the yield of vaccine would be at least three litres from one pair of monkey kidneys, and the yield could go up to four to six litres. That represented about 1500 two-dose immunizations.

Dr. H. SINN asked whether there was any truth in the lay Press reports regarding the recent suspension of the use of the vaccine (in certain parts of America) because poliomyelitis had followed its use.

Dr. Bazeley said there had been some temporary withdrawals of some of the vaccine, but most batches had now been cleared. In California vaccination had been taking place in an area where the present incidence of poliomyelitis was high. Cases in vaccinated children all occurred between two and eight days after the administration of vaccine, and that was too soon for infection from "live" vaccine. About half a million people had been vaccinated, and the case rate was much less than in the non-vaccinated population. However, it was higher than that which existed throughout the State. The explanation of that was at the moment rather obscure, but the paralysis seemed to have occurred too soon to be caused by the vaccine.

Dr. J. MACNAMARA asked whether Dr. Bazeley could give any information about the inoculation of pregnant women.

Dr. Bazeley said that there was no real information about the use of the vaccine in pregnant women, as all the work in the field had so far been confined to certain age groups in children. If a pregnant mother was to be protected, vaccination should be carried out early in pregnancy. He had no information regarding the antibody state of the baby.

and agreed about what is necessary, the raising of funds is a simple matter.

Rheumatology means the study of a single form of pathological change—rheumatic inflammation. Yet it produces such various effects that the rheumatologist needs special knowledge of endocrinology, internal medicine, neurology, psychiatry, orthopaedics, physical medicine and rehabilitation. The chair of rheumatology at Manchester is a pointer which means that this special branch of knowledge must soon be generally recognized.

That Australian doctors are interested is shown by the recent correspondences on PAS and rehabilitation. I do not doubt the virtues of PAS for those who have used it, even as I do not doubt the virtues of Warren Crowe vaccine, gold or any other not-too-toxic drug prescribed by a sympathetic doctor. In other chronic diseases the placebo reaction is a recognized result of treatment with inert drugs (M. J. AUSTRALIA, December 18, 1954). The recognition of the anti-rheumatic qualities of cortisone and "Butazolidin" was an exceptionally good feat of observation when we think of the universal placebo reaction of 70% improvement after any new treatment for rheumatism.

One of the weaknesses of scientific medicine is that it teaches cold detachment to young physicians while they perform so-called controlled trials. But a good doctor can never become detached from his patient's problems. His duty, according to Clifford Allbutt, is occasionally to cure, sometimes to alleviate, but always to comfort. It is fitting to find at last that the controlled trials are not controlled because even the detached modern physician evokes the unwanted placebo reaction. Knowing about this should not make us disbelieve in our favourite remedy. We should apply it with greater enthusiasm and get better results. It should also make us more tolerant if other doctors claim good results for remedies which will not work for us.

Disagreement about the virtues of individual remedies is probably responsible for the failure of rheumatologists in Australia to get together. The time seems propitious now; I suggest to Dr. Smith that during Congress week he should call a meeting of all doctors who are interested in rheumatism, with a view to forming sections of rheumatology in all States.

Yours, etc.,  
M. KELLY.

34 Queen's Road,  
Melbourne,  
July 11, 1955.

#### SEVERE REACTION FOLLOWING PENICILLIN INJECTION.

SIR: I wish to report a severe reaction following penicillin injection.

#### THE AUSTRALIAN RHEUMATISM COUNCIL.

SIR: My letter of March 19 has drawn private comments from interested doctors who are critical yet do not like the blaze of public controversy. Some of my correspondents have pointed out—as also did Dr. S. A. Smith (M. J. AUSTRALIA, April 16)—that the Australian Rheumatism Council is essentially a lay body. Yet it has medical committees whose duty is to organize and educate the medical profession. I have recently seen (*B. R. A. Review*, March, 1955) a report from the Canadian Arthritis and Rheumatism Society, which was founded six months before the Australian Rheumatism Council. In five years it has (i) organized divisions in nearly every province, with many local branches, (ii) initiated clinical and scientific research in collaboration with many universities, (iii) awarded 24 fellowships for advanced training in rheumatology, (iv) increased the number of arthritis clinics at large hospitals from five to thirty, (v) established 47 mobile units for treating patients in their homes, and (vi) given public demonstrations of rehabilitation and social services. The Society was not at all contented, and the report stressed the urgent necessity of intensifying its efforts.

Anyone who has travelled must agree with Dr. Burniston (M. J. AUSTRALIA, June 11) that Australia is ten years behind Europe and America. Every one of us rheumatologists is to blame for this; there is no room for complacency. With or without the blessing of the Rheumatism Council we should have been building local societies of rheumatologists in each State. I cannot agree with Dr. Smith that the raising of funds should come first. The first necessity is that doctors should talk to other doctors about the clinical problems of rheumatology. When doctors have organized

On May 9, 1955, a man of forty-five was diagnosed as suffering from nasal sinusitis and 600,000 units of procaine penicillin given (the needle was inserted first into the outer thigh and then the syringe attached). In about a minute he felt severe burning at the site of injection and then spreading right through the body, associated with a fit of coughing. He became unsteady on his feet, confused and restless, and sweated profusely. His pulse could not be felt. One cubic centimetre of 1:1000 adrenaline was given intramuscularly, but in his restlessness the needle broke off in his leg (recovered later). He fell to the floor, complaining of severe pain between the shoulder blades. His heavy jacket was removed with his partial cooperation, and one cubic centimetre of 1:1000 adrenaline given intravenously followed by 15 milligrammes of "Benadryl". He subsequently stated that it was at this stage he regained consciousness. Shortly afterwards the blood pressure was 50/0. Worsening of symptoms was treated by 20 milligrammes of "Benadryl" intravenously with gradual relief. A half-hour later the blood pressure was 80/2, when he was taken to hospital, having first been given two milligrammes of adrenaline in oil intramuscularly. Five hours after the collapse the blood pressure was 120/80. Adrenaline in oil was given that night, and he was discharged home the following afternoon.

The man states he had had many injections of penicillin previously without reaction, the most recent being eighteen months ago. There is no known allergy in him or his family, except that two months ago he complained of diarrhoea and abdominal pain after eating a meal of oysters, fish and beer.

I presume that this man's reaction was caused by sensitivity to penicillin, though possibly procaine could be the cause.

### Correspondence.

I would be interested to know of others' similar experiences, and advice about subsequent subcutaneous or skin tests, desensitization *et cetera*.

Yours, etc.,

Fig Tree Crescent,  
Fig Tree,  
Wollongong,  
New South Wales.  
July 10, 1955.

F. W. WALTON.

#### MENTAL HEALTH FACILITIES AND NEEDS OF AUSTRALIA.

SIR: In my recent report on the "Mental Health Facilities and Needs of Australia", the position with regard to occupational therapy training in Queensland has not been stated as clearly as I would have preferred. I am, therefore, drawing attention to an amendment which should do justice to this interesting experiment in training, which has been planned by the Board of Studies in Physiotherapy and Occupational Therapy of the University of Queensland.

At the time I visited, July, 1954, the following situation existed. There was a degree course in occupational therapy and physiotherapy; a post-diplomate course in occupational therapy, for those holding the diploma in physiotherapy, had been formulated; and it was hoped, in 1955, to commence a full-time course of studies in occupational therapy, leading to a diploma.

One cannot but wish this venture all success. In mental hospital practice, a worker with the combined skills of physiotherapist and occupational therapist must prove very useful, especially with the large number of organic neurological syndromes found there. I think a person so equipped would be most useful at the early treatment level, either in the admission wards of the mental hospital, or in the psychiatric wards of the general hospital, to promote early recovery and prevent chronicity.

Yours, etc.,

ALAN STOLLER,

Mental Hygiene Authority,  
300 Queen Street,  
Melbourne.  
July 14, 1955.

Chief Clinical Officer.

#### THE RÖNTGEN ORATION.

SIR: In today's issue of the journal there is a letter from G. P. O'Day, filled with what appears to me to be nonsense. Adopting the Marxist philosophy, he implies that there is no choice, no third, apart from "idealism" and "materialism". Marx and the Marxists ignore moderate realism, the proper stream of European philosophy, which began two thousand five hundred years ago with Aristotle, and which has run like a strong stream through Western civilization, of which it is a formative part, and which has plumbed the profoundest depths and soared to the most lofty heights ever reached by human thought, and which has been moulded by the princes of the human intellect. It is a mark of the Marxist that he should shut his mind to the best, in that which he plans to destroy.

Dr. O'Day quotes Berkeley, and suggests that Marxist materialism rejects Berkeley's idealism. He is not right here. Marx was brought up in the German idealism, of Fichte, of Schelling, and of Hegel whose works were compulsory reading in the Prussian schools. Their dialectical idealism led to the glorification of the Prussian State, and finally the German form of totalitarianism, Nazism. Marx sought to change their dialectical idealism to dialectical materialism. But, for him, matter was no more than his own idea of matter, and his philosophy was not essentially different from the Prussian—nor were its fruits—just a different brand of totalitarianism. For both, God is to be denied (with hatred by Marx), and man is for the sake of the collectivity, just as the bee for the swarm.

"Religion . . . deals with concepts and abstractions that cannot be proved by practice." They cannot be proved by practice, if by practice is meant the techniques of the physical sciences, the test tube. But there is a spirit in man, of which the Marxist knows nothing, and which can be proven and demonstrated by the intellect. The relationship of fittingness between the nature of man and the nature of his acts, between his acts and their objects, and

between man and his Maker—these can be proved by reason, rightly used.

"Religion . . . is a human product; its roots are ignorance, fear, misery and class interests." This is true of Marxism. But the terms must be exchanged for their opposites, for application to the Christian religion; for this is "a divine product; its roots are knowledge and truth, love, happiness, and the brotherhood of man, which can be had, but only under the Fatherhood of God". Spirit unites; but Marxism denies it. Matter divides; and Marxism glorifies it.

"Its realm [religion's] is nescience." This is true of the Marxist religion. Revolted, and rightly so, by the stupid scepticism of the last two or three hundred years, which has developed in the schools outside the Aristotelian tradition, Marxism has sought in matter for the absolute. It does not know that matter is for the sake of spirit, and that the spirit of man is greater than the machines and factories and means of production which it contrives. It knows little therefore about the nature of man, and of his inner life. Nor about freedom.

It does not know reality and its laws. It does not know that diverse things are not of themselves united; that there is no infinite regress in causes or movers, *per se* subordinated. It does not know that that which is potential cannot become actual, except through some agent which is itself actual (for a being cannot give to itself something which it does not possess). Even blind Freddie knows these things, at least implicitly. If Marxism knew them, and if it had eyes to see moved things which are not their own movement, agents which are not their own act, contingent things which are not their own existence, composite things compounded of perfection and limitation, and ordered things which are not their own end, then it could see that there must be a First Mover, a First Cause, a First and Necessary Being, a Supreme Exemplar of all Perfections, and a Supreme Orderer; in Aristotle's words "the very Understand Itself, the Understand of an Understand".

But Marxism knows neither God, nor the Spirit of Man. Godless and brutal! What more colossal and disastrous ignorance could a system impose upon its victims? The mark of the beast is upon it. Marxists are to be pitied and prayed for.

"Science cannot be totalitarian." Of course not. It is the form of government (*Führer* or polit-buro) which becomes totalitarian.

"Science is daily reducing that realm" of religion. On the contrary, science is continually turning and reading more pages of the book of nature, and revealing more and more the glory of its Author.

"Science in the next form of society which man is now adopting will tremendously aid every human being to develop fully his or her personality." This is a nonsensical bit of window-dressing. Man's personality depends upon that spirit which is in him, and which can rise above matter in its act and in its existence. Upon this man depends for his essential distinction from the brute, and for his personal rights and dignity.

Now let us turn from the shop-window to the Marx factory. This is a place, surrounded by an iron curtain, in which God and the spirit in man are denied; and in which man, logically enough, is treated like a brute if he is weak, and behaves like a brute if he is strong. The leaders inflict "purges" on each other, and the prime minister and the leader of the opposition shoot each other to settle their political differences. I have before me the Proceedings (published in Moscow) of a Scientific Session (on physiology) held in July, 1950, by the Academy of Sciences of the Union of Socialist Soviet Republics. The basic theme is a worship of Lenin and Stalin, and a sickening exchange between the physiologists themselves of accusation, and self-accusation, for deviating from the party line. They show no mercy for each other. Physiology must subserve Marxism.

The next paragraph in Dr. O'Day's letter forgets the shop-window, and lets the cat out of the bag: ". . . each individual is a unique and unrepeatable entity. But so is each dog, whale, cat, snail and almost certainly each atom." Nothing here about the person. No distinction between man and brute. They are equi-parated. The one is as the other. Here is materialism in its stark nakedness.

The foundation for such dehumanizing of man was laid by the nominalists, the empiricists and the positivists, who teach that intellect is not essentially different from the senses which we share with the brute, that sense knowledge is the sum of human knowledge, and that man therefore cannot know the nature of things. As a corollary, right and wrong "cannot be assessed objectively", but depend upon



the will of the ruler. With this rubbish, the professors have been softening us up for totalitarianism for three or four hundred years, even in this city today.

"Social advances [*sic*] are removing the roots" of religion. Especially behind the iron curtain. And how! But they cannot ultimately succeed, for man's intellect has a natural tendency to truth, and by nature he is religious.

The inhuman ideas sponsored by Dr. O'Day are now imposing upon us the darkest of our dark ages. For the first time in human history the deliberate policy of great States has included the mass murder of its own and of neighbouring peoples. Before this age has passed, the materialism now dividing mankind will bring down upon our children the greatest catastrophe and the greatest sum of misery endured by the human race since it began. This is not a prophecy, for the process has already begun. But the worst is yet to come. The atheistic dehumanizing tide is already lapping the city walls, and percolating the sewers, even to its political, industrial, academic and professional suburbs.

Yours, etc.,

V. J. KINSELLA.

235 Macquarie Street,  
Sydney,  
July 30, 1955.

#### A MEDICAL SCHOOL FOR WESTERN AUSTRALIA.

SIR: Here in Western Australia we are becoming interested and excited about the idea of a medical school. Before we commit ourselves irrevocably, may I ask a few questions?

Is the present population of Western Australia big enough to provide sufficient and varied clinical material to educate fully the medical student in his last years? I am not referring to rare diseases as such, but to the less common conditions. For example, we might mention syringomyelia, dislocated hip joint, paraphimosis, Hutchinson's teeth and brachial cysts of congenital origin. It would be easy to open "Tidy's Medicine" and make a long list.

My own medical training was in London, and each hospital was drawing, though not exclusively, on a population of about 2,000,000 persons. The medical training schools in the provincial towns of England would be drawing upon a similar number if the country districts around were included. The same would apply, no doubt, to Melbourne and Sydney.

To examine a patient with a particular disease or condition is a very different thing from reading about it in a text-book or even from seeing a coloured film on the subject.

The other important question I want to ask is about the honorary staff teaching clinical subjects. Firstly, will a doctor who is giving up two days a week to teaching students, operating *et cetera* be able to earn enough himself on the remaining three and a half days to support himself and his family in the style to which he and they are accustomed? If the answer is "no", for a town the size of Perth, then the honorary concerned may be forced to give less of his time and enthusiasm to the students. Secondly, will the teaching registrars, who will have to fill the vacuum noted above, have the solid experience to teach the clinical students? As we know, good clinical teaching comes from a long experience of medical cases as well as of life in general.

I write all this because I seem to have become a Westralian, at first by chance and now by choice, and I do not want to see established a second-rate medical school turning out third-rate doctors.

Yours, etc.,

SHAKESPEAR COOKE.

Goomalling,  
Western Australia,  
July 18, 1955.

#### TRIETHYLENE MELAMINE (TEM) IN THE TREATMENT OF MALIGNANT LYMPHOID DISEASE.

SIR: In contrast to Dr. Hambly and Dr. Robertson (M. J. AUSTRALIA, June 18), we have found serial bone-marrow examinations a necessity in following the progress and estimating the dosage of TEM in chronic leuchæmias and Hodgkin's disease. In our experience a fall in one or more elements of the peripheral blood can be classified as acute or chronic. The acute fall may affect only one element, often the platelets, or may be pancytopenic, and is invariably predominantly hypersplenic. In all cases in which we have observed this complication, with one exception, treatment

with blood transfusion, cortisone and "Terramycin" has tidied the patient over this phase. In the one exception the phase was prolonged and only terminated by splenectomy. Cases 20, 21 and 22 described by the above authors appear classical examples of this response.

A more chronic fall usually involving all elements, excepting the abnormal cell in leuchæmias, is always found to be due to either bone-marrow involvement or hypersplenism. When hypersplenism has been excluded, in all remaining cases the fall in peripheral blood has been associated with massive infiltration of bone marrow, this tissue being greatly increased in quantity and very vascular.

In our opinion, the cause of death in these patients has either been refractoriness of the disease to the drug used or interference with cellular metabolism shown by the development of renal, hepatic or gastro-intestinal complications. As we have stated in our paper on this subject, it is extremely important to differentiate hypersplenism from bone-marrow depression. Serial bone-marrow examinations play an important part in this regard.

Our more recent experience has only confirmed the value of TEM in certain reticuloses, in particular chronic lymphatic leuchæmia.

Yours, etc.,

J. H. BOLTON.

R. H. D. BEAN.

Repatriation General Hospital,  
Heidelberg,  
Victoria.  
July 18, 1955.

#### Reference.

BOLTON, J. H., and BEAN, R. H. D. (1954), "The Immediate Action of Triethylene Melamine in Chronic Lymphatic Leuchæmia", M. J. AUSTRALIA, 2: 474.

#### Obituary.

##### ARCHIBALD JOHN COLLINS.

WE are indebted to DR. J. G. HUNTER for the following appreciation of the late Sir Archibald John Collins.

The passing of Sir Archibald Collins, D.S.O., M.C., in the early morning hours of Friday, June 24, may in strict truth be described as calamitous to the welfare of the medical profession in Australia. His was a leadership which inspires the belief that though it may be equalled it will not be excelled.

Archibald John Collins was born on June 19, 1890, at Lismore. His father, James P. Collins, a Canadian, was a graduate, Master of Arts, of the University of Toronto. Archibald Collins was educated at Fort Street School, Sydney, where he soon displayed that ability to learn and lead, which characterized his whole career. From Fort Street, having been *dux* of the school, in 1908 he entered the Faculty of Medicine, at the University of Sydney. With other honours during his studies he gained first-class honours at graduation in 1913.

Awarded the Walter and Eliza Hall Travelling Scholarship for Medical Research, in 1914, he esteemed it less than the call of duty, and after serving as a resident medical officer in the Royal Prince Alfred Hospital he enlisted, in 1915, in the Australian Imperial Force. He served in France, and for outstanding bravery in the field was awarded the D.S.O. and M.C., being also mentioned several times in dispatches. Returning to Australia in 1919, he was again appointed to the staff of the Royal Prince Alfred Hospital, and from 1920 till 1923 he was superintendent.

Since 1923 he had practised as a consulting physician. He was appointed in that year assistant physician to the Royal Prince Alfred Hospital, physician in 1934, consulting physician in 1950. Rendering still further service to his old hospital, he was a member of the Board of Directors from 1935 till his death. He was consulting physician to the Royal Australian Navy, as also to the Hornsby District Hospital.

In the University of Sydney Collins filled, among many important posts, that of lecturer in therapeutics and clinical medicine; and he had long membership of the Senate, 1935 to 1954. He was a foundation Fellow of The Royal Australasian College of Physicians.

Collins was at all times a good teacher; able to impart his knowledge clearly, and to interest others in the subject in which he was himself interested. He made a worthy

contribution to the advancement of medical education and science in Australia. Collins had a clear, well ordered mind. With great capacity for organization and administration, he was also a wise counsellor, and though quick in grasp of detail, he never forgot the wider view.

The name of Archibald John Collins is firmly written in the history of the British Medical Association, his work for which was outstanding. Having joined the Association in 1918, he was a member of the Council of the New South Wales Branch from 1930 till his death. He was elected President of the Branch in 1934, and Vice-President in 1948. Acting as Honorary Secretary of the Branch, 1937 to 1948, he was also Branch representative on the Federal Council in 1937, and from 1945 till his death, while in 1951 he was elected President. He represented the Federal Council at the inaugural meeting in London in 1948 of the British Commonwealth Medical Conference, and also at the second annual meeting of the World Medical Association in Geneva in 1948.

During the long period of his Council membership Collins strongly influenced the policy and activities of the British Medical Association. His leadership was made notable by his great knowledge both of his profession and of men and affairs, by his sense of justice, unselfish devotion to the task, and fearlessness in expressing his views. He was an excellent speaker and debater, with the right turn of phrase and apt allusion. Always ready to listen to the other man's point of view, he yet would never allow any diversion from main issues.

At the beginning of 1955 Her Majesty the Queen was pleased to create him a knight bachelor for "significant service as a leader in the medical profession".

He was active in the development of the Federal Government's National Health Service, and held the chairmanship both of the Statutory Pharmaceutical Benefits Advisory Committee and of the Federal Pensioner Medical Service Advisory Committee. For many years he was an Honorary Director and Consulting Physician of the Australian Red Cross Society, New South Wales Division.

His death, though not quite unexpected, as he had had several coronary attacks in recent months, was a grief to those who were closely associated with him. They will long and gratefully remember his devotion and service, his courtesy and kindness.

To the medico-political developments which have been a feature of the Association's activities, during the past twenty years, Collins greatly contributed. In all the negotiations with the Commonwealth Government, in respect of its National Health Service, he showed a statesmanlike skill, and the profession in Australia will remember with gratitude the advantages it thus obtained. Never sparing himself in his work for the profession, as never in his general devotion to public objects, he was active with undiminished energy even in the last months of his life.

As a physician Collins had a high ideal, and scrupulously practised the profession's exacting discipline. Few careers show as much fulfilment, and he was brilliantly alert to the last. His friendship is an abiding possession. As to achievement, if it were in the estimation of his fellows, he might have silently repeated, *Exegi monumentum aere perennius*.

Collins was most happy in his married life, and general sympathy will be felt for Lady Collins and her two sons.

At the funeral service at Saint Stephen's Presbyterian Church, Sydney, Dr. H. R. R. GRIEVE gave an address; he spoke in the following terms:

"Fellows in faith, we are gathered in humility and in love to commit unto the keeping of God Almighty our beloved brother, Archibald John Collins.

"I speak as a colleague in medicine and as one of countless friends to all of his world—and his world and his interest were continuous with humanity itself—I speak to all who had cause to perceive during his life the greatness of his soul.

"His life was founded on simple, staunch Christian faith and on the inspiration and the incentive for service, often subconscious but always there, with which that faith never fails to endow the truly great men. In the transcending causes which he at all times in his life so zealously espoused he was driven by an unshakable faith in ultimate good such as Saint Paul himself professed to the Romans. Like many another genius of a leader—and his life was almost all leadership—he discovered his soul in the crucible of battle. Eye-witnesses have stated that the quality of his bravery in action was magnificent.

"His moral courage shone conspicuously in all places and at all times. He feared not the consequences of speaking and meeting the truth. In the darkest moments when freedom seemed certain to pass into eclipse he did not falter but

persevered, with the power of truth and courage to sustain him. In those days his courage and his clarity of vision and his faculty for decision, like lights in the sky, pointed the path for all to tread. He was for us in medicine a natural leader. When all longed for freedom to survive he more than any individual helped to preserve it. Indeed the freedom to achieve in his own design the highest interest of his fellow beings seemed inherent in his very substance.

"His courtesy and his kindness and his tolerance were the natural companions of his moral strength and they reinforced it. He was a faithful friend when to be faithful was in lesser ways costly.

"As he himself many times said, he came into this life quietly and he wanted to leave quietly. He sprang, significantly enough, from a family of preachers and teachers. The manner of his going was the peaceful, unobtrusive way of the gentleman he was.

"He loved humanity, he loved medicine and he loved his family. He was the completely wise *paterfamilias*.



"We are in deep sorrow for his widow bereft, and for the sons who will miss a perfect father.

"We humbly pray that his life of pure service will have earned the mercy and the blessing of the dear Lord."

DR. ANGUS MURRAY writes: There was a certain stark simplicity in the manner of our farewell to Archie Collins at Saint Stephen's Church that was in keeping with the manner of man he was. The flag under which he slept dominated the scene as it had dominated his life, and the absence of flowers could be regarded as symbolic of the singleness of purpose characteristic of the man.

It was said of him by Dr. Grieve in his quiet and touching tribute that "he had found his soul in the crucible of battle", and there was much of truth in this, for he had all the instincts of the soldier in the highest sense of the word, in that he served and fought for the cause he espoused with a courage and devotion far beyond that of most of his fellows.

In an hour spent with him on the night on which he fell into his final sleep, we somehow harked back to the first World War and he talked as I had never heard him talk before of experiences therein. He lived again that night through Bullecourt, Delville Wood and Passchendaele in the great and glorious company of the comrades of his youth.

He rejoined the "Lost Generation" that night; and when we consider the record of service given to his fellows in the years after the war, we may indeed be grateful that he was spared; and realize afresh the bitter loss the country has suffered, and is suffering, in being deprived of the leadership of his comrades who rest where they fell in foreign fields.

DR. ERIC SUSMAN, Senior Physician and Chairman of the Medical Board, Royal Prince Alfred Hospital, writes: The Royal Prince Alfred Hospital has suffered a grievous loss by the death of Sir Archibald Collins. He had the closest association with this institution for the whole of his professional life. He married a Prince Alfred sister, and his doctor son was born in the Missenden Road.

He was a superb medical superintendent. He made it his business to know intimately the members of his resident staff. He corrected their individual errors, sought to rectify their weaknesses, encouraged their good points, and praised their infrequent exhibitions of talent and industry. To the young resident medical officers of his day, "The Super.", with his brilliant military background, was a real hero, and he won, without any striving, the loyalty and devotion of his medical staff.

Sir Archibald was an ideal teacher for undergraduates. Eschewing the flamboyant, the spectacular, the theatrical, his lectures and bedside demonstrations were simple, clear, concise, dogmatic and practical, packed full of accurate information and common sense. Many of his old pupils, now teachers themselves, have modelled their style and method along the lines laid down by him. Public speaking, no matter to what audience, came to him naturally, and without effort.

He always maintained that, for clear thinking, a man must have beliefs and must have certain faiths. To be prepared to change these is never easy, and even a "big" man, like Collins, found this to be a difficult procedure. On any given topic, he took a long time, and gave much anxious thought before coming to a decision. This decision, once made, was almost always a sound one. But he hated to change it. The same thing obtained in his medical diagnoses. My old friend would taunt and mock me from the grave for a most unworthy display of hypocrisy (which he loathed) if I failed in his obituary notice to draw attention to this curious strain of obstinacy in his mental makeup.

Fortunate indeed was the man who had A. J. Collins as a friend. He understood everything about the principles and practice of friendship—affection, good fellowship, loyalty, courtesy, humour, tolerance and *Gemütlichkeit*. There was no such thing as a dull or wasted evening spent in his company. One always learned something new, or got a fresh slant on an old problem. He was a good talker and a tolerably proficient bridge player. He fitted in, quite snugly, to the social solidarity, the cultural conventionalities and the over-all behaviouristic pattern of the North Shore line. At the bridge table, if his partner made a chancy or foolish bid, and incurred a well-deserved penalty, his mild rebuke would simply consist of the sentence: "We don't do that in Killara." And this, always accompanied by an idiosyncratic and disdainful blepharospasm.

It is hard to imagine the future at "P.A." without the wise counsels, the honesty, the integrity and the charm of this good and gentle man. May his memory stay with us for

many a long year, and may the example of his life and work be an inspiration and encouragement to those who follow him.

DR. KEMPSON MADDOX writes: It is difficult to envisage a greater loss to the medical profession of Australia at the present time than that sustained by the death of Sir Archibald Collins. It is serious enough for his colleagues and patients to be suddenly bereft of his professional wisdom, but for the corporate body of medicine in the country to be deprived of his experienced leadership in the midst of a dynamic era in the history of our profession is a tragic development.

His many activities, his long service in the cause of the British Medical Association, his selfless energy, his eloquent oratory, and his fearless judgement made him an almost ideal Federal President, and gave him a capacity for instant decision and a logical approach in administrative problems. He did not tolerate fools and was never for an instant in doubt as to his opinion of any question or individual. Like all men of his calibre, he had his prejudices and was not afraid to state them. At the same time he was essentially fair-minded and receptive of new opinion. He was justifiably proud of his service as a battalion medical officer, of his association with the Royal Australian Navy, the Red Cross, and the Prince of Wales Hospital, Randwick, but his work and influence at the Royal Prince Alfred Hospital was his greatest, most effective contribution to Sydney medicine.

Leadership is born, not made, and, as Dr. Grieve said in his address at the memorial service, Sir Archibald became a leader in every field in which he found himself. Others will describe in detail his remarkable record of official service to the medical profession as a body, and of the strength and adherence to the highest principles which he bestowed in times of difficulty.

His consistent friendliness, loyalty and personal charm gave boundless pleasure to his patients and friends, to many of whom he was little short of an idol, while the hospitality and atmosphere of his home was a by-word. He saw to it that his many activities did not keep him from his devoted family, and Lady Collins aided and graced his life. His sons have already proved that they have inherited his tenacious courage and devotion to duty.

#### CHARLES MITFORD LILLEY.

DR. J. V. DUHIG has sent the following appreciation of the late Dr. Charles Mitford Lilley.

On April 16, 1955, at the age of sixty-five years, when I would have predicted for him another ten years of life, which, for him, could not be other than useful and beneficent, Charles Lilley, one of the greatest of surgeons in Australian medical history and possibly the greatest in his time, died. Discussion will always take place about his real place in contemporary Australian surgery. Most people who know and to whom I have spoken rate him higher as a thyroid surgeon than anybody else in Australia in his time, while many old timers think him the best surgeon Queensland has ever had. If that is not true, it is near enough to the truth to place Charles Lilley in the highest rank as a surgeon. As a man, I have never known better, and I think on the whole he was the best man I ever met. I knew him for just on fifty years. He had a sharp cutting tongue, but the sweetest nature ever man possessed. We started practice as consultants in the same building about 1920, and with one change of venue, we practised in the same building for thirty-five years. Never a day went by that he did not come up to see me: quite often the talk was about trivialities, fishing or boating, of which he was very fond, but there was always an undercurrent of seriousness that meant that Charles was after some opinion or reference on some topic of philosophical importance. It may surprise many that, though Charles appeared to lack self-expression and not to know much outside his work, which he knew, of course, profoundly, his reading was wide and rather curious. I suppose it was his love of boats which made him quite an authority on Pepys and the state of the Navy at the Restoration down to the Revolution. However, as an index of his direct mind, he was not much interested in the side issues of the politics of the time. Had he had the gift of self-expression, which he knew he lacked (but took no pains to alter as perhaps he had not the time), he would have had no peer in Australia as surgical teacher and demonstrator, as his talents really meant him to be.

Charles Lilley was really the grandson of his grandfather, Sir Charles Lilley, who came to Queensland from England at



the age of twenty-six years and later became Attorney-General and Premier of the Colony of Queensland. He was Chief Justice from 1879 to 1893. Like him, our Charles Lilley never hesitated to say what he thought of injustice and oppression, both immediate and distant, while his hatred of falsehood was complete. I know that after fifty years.

To talk of Lilley's early life is to me an anachronism. He graduated in 1914, the great year of Sydney graduates. During the early years of the first World War he ran the Brisbane Hospital in conjunction with Dr. E. S. Meyers, until recently Dean of the Faculty of Medicine in the University of Queensland. After that he enlisted, and I met him in the Second Field Ambulance. He was still the excessively humble surgeon. I saw surgery in the casualty clearing stations which was not very good, and here was a first-rate surgeon rusting in an ambulance. But Charles



was a really great man: he could serve in a lowly subordinate capacity and be content. Our field service made us, if possible, better friends, and I would like to say again that I have never known a greater or a better man.

Before he started specialist practice, he had a general (really a night) practice in the Paddington-Bardon area, most of it being a poor district. After specializing, he continued to visit these patients when in trouble.

There was one thing about Charles Lilley that I think unique. After he had done a big list at the Brisbane Hospital (which he did so much to develop) he would go back to see how the bad cases were doing.

As I knew Charles Lilley, his great qualities were his supreme confidence in his power as a surgeon, and of these there is not only no doubt but general agreement. Surgeons from all over Australia should have been flocking to him. But to me, above all things, I value the kind gentle Pepsysian, who never let the sun go down upon his wrath.

Charles Lilley was a great man, but a most humble devoted one. As I write this, I can see him only through a mist of sorrow as one sees a landscape in rain. His daily visit to me is a poignant memory of a truly great man.

Luckily, Lilley's technique and success as a surgeon have inspired a young generation of surgeons, who will carry on the Lilley tradition: I know at least five young surgeons who can more than hold their own with the southerners.

One of Lilley's greatest prides was his senior graduates, a pride in which I also shared. If the surgical school of Queensland becomes famous, and I think it should, it will be due in some measure to the late Charles Lilley.

To me he was more than a doctor; he was a great man.

DR. J. J. POWER writes:

With the death of Charles Lilley on April 17, 1955, I feel I have lost a very close and sincere friend; and the number of people who feel likewise is legion. This was very well exemplified by the representative gathering at the service.

He was educated at the Brisbane Grammar School and from there went to the University of Sydney, residing at Saint Andrew's College; he graduated in March, 1914, and returned to the Brisbane Hospital, becoming superintendent in 1916, and enlisted as soon as he could be relieved from this responsible position; he joined the Australian Imperial Force and saw service in France. On his return he joined the surgical staff of the hospital and served in that capacity from 1920 to 1954.

I think I can truthfully state that he conducted for very many years the biggest general surgical practice in Queensland. He excelled in surgery of the thyroid, and some years ago he told me he was averaging a thyroid operation a day, a figure that really means something, knowing his conservative approach to the subject.

When his time came to retire from the hospital staff his only regret was: "What will I do with my poor patients? Where will I send them?"

The appreciation of the public both medical and lay in the daily Press is a warm tribute to our late friend Charlie Lilley, and already the Charles M. Lilley Memorial Fund has been established, the idea being to have, first, a prize for the student who tops the final surgery examination and, second, a portrait which will commemorate his memory for all time. The success of the fund was established the day it was opened, a few of his friends guaranteeing the full amount if there was a deficiency, a most unlikely event.

He never sought the limelight, hated sham and humbug and often purposely stayed away from surgical meetings, feeling he would be compelled to attack those indulging in loose talk. Years ago we discussed the education of the post-graduate desirous of obtaining a higher surgical qualification, and just as one would expect he did in no uncertain manner make provision for such cases.

The sympathy of all will go to his sisters (he never married), and I know they have received great consolation from the many letters and personal expressions of sympathy.

A JUNIOR SURGEON writes:

In paying tribute to the memory of the late Dr. Charles Lilley I would like to especially mention his ready willingness to train and assist younger men, and he will always be remembered by those who were fortunate enough to work with him as residents at the Brisbane Hospital. His outstanding surgical skill has been an inspiration to us, and one has felt a certain pride in finding that leading surgeons in other parts of the world could not better him in certain fields, particularly thyroid surgery. His interest in the younger generation of surgeons will now be perpetuated by the generous post-graduate scholarship for which he has provided. His death has come as a sad blow to us all who held him in such high esteem.

## Naval, Military and Air Force.

### APPOINTMENTS.

The undermentioned appointments, changes et cetera have been promulgated in the Commonwealth of Australia Gazette, Number 29, of June 23, 1955.

#### NAVAL FORCES OF THE COMMONWEALTH.

##### Permanent Naval Forces of the Commonwealth (Sea-Going Forces).

Confirmation in Rank.—Surgeon Lieutenants (for Short Service) (on probation) Michael Francis Cleary and Joseph Brian Shells are confirmed in the rank of Surgeon Lieutenant (for Short Service), with seniority in rank of 2nd January, 1954, and 27th January, 1954, respectively.

**Citizen Naval Forces of the Commonwealth.****Royal Australian Naval Reserve.**

**Appointments.**—John Lavers Bartram and Bryan Hudson are appointed Surgeon Lieutenants, dated 11th February, 1955, and 15th March, 1955, respectively.

**Promotion.**—Surgeon Lieutenant Ian Douglas Wilson is promoted to the rank of Surgeon Lieutenant-Commander, dated 21st May, 1954.

**AUSTRALIAN MILITARY FORCES.****Citizen Military Forces.****Northern Command.**

**Royal Australian Army Medical Corps (Medical).**—To be Captain (provisionally), 29th April, 1955: 1/46809 Peter John Millroy.

**Eastern Command.**

**Royal Australian Army Medical Corps (Medical).**—2/145604 Captain (provisionally) J. M. Verge relinquishes the provisional rank of Captain and is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Eastern Command) in the honorary rank of Captain, 22nd February, 1955.

**Southern Command.**

**Royal Australian Army Medical Corps (Medical).**—The provisional appointment of 3/101024 Captain G. R. Stirling is terminated, 26th February, 1955. To be Captain (provisionally), 27th February, 1955: 3/101024 George Randall Stirling.

**Central Command.**

**Royal Australian Army Medical Corps (Medical).**—The provisional appointments of the following officers are terminated, 14th November, 1953: Captains 4/35428 K. F. Milne and 4/32015 W. D. Proudman. To be Captains (provisionally), 15th November, 1953: 4/35428 Kevin Fowler Milne and 4/32015 William David Proudman.

**Western Command.**

**Royal Australian Army Medical Corps (Medical).**—5/26394 Captain (Honorary Major) H. J. Rowe is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Western Command), 13th April, 1955.

**Tasmania Command.**

**Royal Australian Army Medical Corps (Medical).**—To be Captain (provisionally), 19th April, 1955: 3/129187 Peter Humphrey Gilbert MacCallum.

**Reserve Citizen Military Forces.****Royal Australian Army Medical Corps.**

**Southern Command.**—The resignation of Honorary Captain A. H. Keech of his commission is accepted, 4th April, 1955.

**ROYAL AUSTRALIAN AIR FORCE.****Permanent Air Force; Medical Branch.**

The following are appointed to a short-service commission, on probation for a period of twelve months, with the rank of Flight Lieutenant: Stanley Albert Ward (039983), 2nd May, 1955; Keith Norman Maunder (0217162), 3rd May, 1955.

**Air Force Reserve: Medical Branch.**

The following former officer is appointed to a commission, 22nd February, 1955, with the rank of Flight Lieutenant: W. Buckingham (025670).

Ian Oriel Thorburn (295550) is appointed to a commission, 2nd August, 1954, with the rank of Flight Lieutenant (Temporary Squadron Leader).

**Congress Notes.****AUSTRALASIAN MEDICAL CONGRESS (BRITISH MEDICAL ASSOCIATION).**

THE following notes relate to the Australasian Medical Congress (British Medical Association), Ninth Session, to be held at the University of Sydney from August 20 to 27, 1955.

**Registration Office.**

In the newsletter issued to members of Congress on July 25, 1955, it was advised that the registration office would be open on Saturday, August 20, from 9 a.m. to 12 noon. It has now been decided that the office will be open from 9 a.m. to 5 p.m.

The hours on other days will be as follows:

Monday, August 22: 9 a.m. to 5 p.m.

Tuesday, August 23, to Friday, August 26: 9.30 a.m. to 5 p.m.

The registration office will be in the Union Hall, University of Sydney.

**Post-Graduate Work.****NUFFIELD FOUNDATION DOMINION TRAVELLING FELLOWSHIPS.****Awards to Australian Graduates.**

THE Nuffield Foundation will continue in 1956 its scheme of offering a number of travelling fellowships to Australian graduates. Seven awards will be available, including two fellowships in medicine, two fellowships in the natural sciences, one fellowship in the humanities, and one fellowship in the social sciences.

The purpose of the fellowships is to enable Australian graduates of outstanding ability to gain experience and training in the United Kingdom in their chosen fields, and to make contact there with scholars working in those fields, with a view to the Fellows' equipping themselves to take up senior posts in research and teaching in Australia.

The fellowships are intended for men or women of first-rate intellectual and personal qualities, who have already shown unusual capacity to advance knowledge and teaching in one of the fields concerned. The Foundation wishes the awards to be open on as wide a basis as possible, and applications from persons with degrees in such fields as dentistry, veterinary science, engineering, architecture *et cetera*, as well as those in the fields already mentioned, will be welcome. Candidates must be Australian nationals, normally between the ages of twenty-five and thirty-five years, and must be university graduates holding, preferably, a master's or doctor's degree, and having subsequently had a year or more of teaching or research experience on the staff of a university or comparable institution.

A fellowship will normally be tenable for one year, but in exceptional cases may be extended for a further period of a few months. The fellowship will provide for return travelling expenses of a Fellow between his home residence and the United Kingdom and, if he is married, similar expenses for his wife; an adequate allowance will be made for the Fellow's living and travelling expenses in the United Kingdom and for his academic fees, books and other incidental expenses, as well as a personal allowance. The total value of an award, including all travelling expenses, varies with the needs and family responsibilities of the holder, but will in no case be less than £900 sterling.

A Fellow will be expected to resume residence in Australia on the completion of the fellowship.

Except with the express permission of the trustees of the Foundation, a Fellow may not hold any other award concurrently with the fellowship.

A Fellow will be required to carry out, at centres approved by the trustees of the Foundation, a programme of research work and training, similarly approved. Other work, paid or unpaid, may not be undertaken without the permission of the trustees. During the tenure of the fellowship a Fellow will not normally be permitted to prepare specifically for, or to take, examinations for higher degrees or diplomas awarded by bodies in the United Kingdom.

A fellow will be required to submit to the trustees, at the end of the fellowship, a report on his work during the fellowship.

Should the trustees at any time find that a Fellow neglects or has neglected the obligations of the appointment, they shall have power immediately to terminate the fellowship.

The fellowships will be awarded by the trustees of the Foundation on the recommendation of its Advisory Committee in Australia.

Applications for fellowships to begin in 1956 should be submitted not later than October 25, 1955, to The Secretary, The Nuffield Foundation Australian Advisory Committee, c/o Union House, University of Melbourne, Carlton, N.3, Victoria, from whom copies of the application form may be obtained.

Obstetricians and Gynaecologists, 8 Latrobe Street, Melbourne, or by telephone (FJ1262) would be appreciated before 5 p.m. on Friday, September 16, 1955.

## The Royal College of Obstetricians and Gynaecologists.

### VICTORIAN STATE COMMITTEE.

THE Victorian State Committee of the Royal College of Obstetricians and Gynaecologists is conducting an all-day meeting at the College House, 8 Latrobe Street, Melbourne, on Sunday, September 18, 1955, commencing at 11 a.m. The programme will be as follows: 11 a.m., "Management of the Rhesus Immunized Mother and Baby", G. G. Champion, M.R.C.O.G.; 11.20 a.m., "The Diagnosis and Management of Ovulation Pain", F. J. Hayden, F.R.C.O.G.; 11.40 a.m., "A New Approach to Hypertension in Pregnancy", W. Morton Lemmon, F.R.C.O.G.; 12 noon, "Hormones in the Treatment of Menorrhagia", J. W. Johnstone, F.R.C.O.G.; 12.20 p.m., "Dyspareunia", R. G. Worcester, F.R.C.O.G.; 2 p.m., "Local Causes of Pruritus", Leslie W. Gleadell, F.R.C.O.G.; 2.20 p.m., "The Management of the Established Toxaemia", C. N. De Garis, M.R.C.O.G.; 2.40 p.m., "Difficulties and Dangers of Curettage", D. F. Lawson, F.R.C.O.G.; 3 p.m. to 4 p.m., quiz, under the chairmanship of J. W. Johnstone, F.R.C.O.G. Adequate time will be allowed for discussion. A three course dinner will be served at 1 p.m. in the College House.

The meeting has been particularly arranged to interest general practitioners. The fee for the meeting, including dinner, is £2 per head. In order to allow arrangements to be made for the meal, advance booking by letter to the Secretary, Victorian State Committee, Royal College of

## Public Health.

### NOTIFICATION OF INFECTIVE HEPATITIS IN VICTORIA.

A COPY of the following letter relating to notification of infective hepatitis in Victoria has been sent to all medical practitioners in that State by the Secretary, Commission of Public Health, Victoria. It is published here at his request.

[COPY.]

295 Queen Street,  
Melbourne,  
4th July, 1955.

#### INFECTIVE HEPATITIS.

Dear Doctor,

Since Infective Hepatitis was declared a notifiable infectious disease the notifications received by the Department have shown a very patchy distribution with considerable variation in incidence in closely contiguous areas.

Investigations by Departmental officers have shown that some doctors are notifying all cases, including probable cases, most conscientiously, whilst other doctors are notifying only those patients who manifest marked jaundice.

The Health Commission requested the Royal Australian College of Physicians to suggest clinical criteria to form a basis for notification.

A sub-committee of the College suggested that two varieties of the disease should be recognized, i.e., infective hepatitis with jaundice and infective hepatitis without jaundice.

On 31st May, 1955, the Health Commission decided:

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED JULY 23, 1955.<sup>1</sup>

Disease.	New South Wales.	Victoria.	Queensland	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia.
Acute Rheumatism .. ..	4(3)	..	4(3)	1	..	..	..	..	9
Amoebiasis .. ..	..	..	..	..	..	1(1)	..	..	1
Ancylostomiasis .. ..	..	..	..	..	..	..	..	..	..
Anthrax .. ..	..	..	..	..	..	..	..	..	..
Bilharziasis .. ..	..	..	..	..	..	..	..	..	..
Brucellosis .. ..	..	..	..	1	..	..	..	..	1
Cholera .. ..	..	..	..	..	..	..	..	..	..
Chorea (St. Vitus) .. ..	2	..	..	..	..	..	..	..	2
Dengue .. ..	..	..	..	..	..	..	..	..	..
Diarrhoea (Infantile) ..	4(2)	13(12)	3(2)	..	..	..	..	..	20
Diphtheria .. ..	2	2(2)	3(2)	..	8(7)	..	..	..	15
Dysentery (Bacillary) ..	..	..	..	..	1	1	..	..	2
Encephalitis .. ..	2(1)	2(2)	..	..	..	..	..	..	4
Filariasis .. ..	..	..	..	..	..	..	..	..	..
Homologous Serum Jaundice	..	..	..	..	..	..	..	..	..
Holadid .. ..	..	1	..	..	..	1	..	..	2
Infective Hepatitis .. ..	25(11)	95(54)	..	12(6)	9(3)	1	1	..	143
Lead Poisoning .. ..	..	..	..	..	..	..	..	..	..
Leprosy .. ..	..	..	..	..	..	..	..	..	..
Leptospirosis .. ..	..	..	2	..	..	..	..	..	1
Malaria .. ..	..	2(2)	3(3)	..	..	..	1	..	6
Meningococcal Infection ..	4	3(3)	2(2)	..	..	1	..	..	9
Ophthalmia .. ..	..	..	..	..	..	..	..	..	..
Ornithosis .. ..	..	..	..	..	..	..	..	..	..
Paratyphoid .. ..	..	..	..	..	..	..	..	..	..
Plague .. ..	..	..	..	..	..	..	..	..	..
Poliomyelitis .. ..	6(5)	1	..	3(1)	..	..	1	..	12
Puerperal Fever .. ..	..	..	1	..	..	..	..	..	1
Rubella .. ..	..	26(18)	..	1(1)	2(2)	..	..	..	29
Salmonella Infection .. ..	..	..	..	..	..	..	..	..	..
Scarlet Fever .. ..	11(6)	11(8)	24(3)	4(4)	1(1)	2(1)	..	..	53
Smallpox .. ..	..	..	..	..	..	..	..	..	..
Tetanus .. ..	..	..	..	..	..	..	..	..	..
Tetechoma .. ..	..	..	..	..	239	..	..	..	239
Tetichnosis .. ..	..	..	..	..	..	..	..	..	..
Tuberculosis .. ..	27(16)	16(10)	16(6)	5(5)	15(12)	4(1)	..	..	83
Typhoid Fever .. ..	..	..	..	..	..	..	..	..	..
Typhus (Flea-, Mite- and Tick-borne) .. ..	..	..	2	..	1(1)	..	..	..	3
Typhus (Louse-borne) ..	..	..	..	..	..	..	..	..	..
Yellow Fever .. ..	..	..	..	..	..	..	..	..	..

<sup>1</sup> Figures in parentheses are those for the metropolitan area.



"That all definite cases of infective hepatitis, i.e., those showing jaundice, anorexia, nausea and tender liver and those proved by biochemical tests, should continue to be notified as at present. Less definite cases, which show no jaundice and where no opportunity for biochemical investigation is available, should be notified as infective hepatitis (probable)."

It is requested that medical practitioners place all notified cases in one of these two categories.

Yours faithfully,

G. V. STAFFORD,  
Secretary, Commission of Public Health.

## Notice.

### PRESENTATION OF PORTRAIT TO MAJOR-GENERAL F. K. NORRIS.

DURING Congress week, Major-General F. Kingsley Norris will be presented with a portrait of himself, as a token of appreciation for his services as Director-General of Medical Services of the Australian Army. This function will take place in the Stawell Hall, 145 Macquarie Street, Sydney, on Monday, August 22, 1955, at 4.30 p.m. All who are interested are invited to attend this ceremony, particularly those who served in the army with General Norris, either overseas or in Australia.

### ROYAL AUSTRALIAN AIR FORCE MEDICAL SERVICES DINNER.

For the Royal Australian Air Force Medical Services Dinner to be held on August 23, 1955, at Richmond, New South Wales, a Royal Australian Air Force bus will be available to take officers requiring transport to Richmond. The "pick up" stations and times of departure are as follows: Martin Place (G.P.O. side, abreast of Cenotaph), 1800 hours; University Steps, Parramatta Road, 1815 hours.

## Honours.

### THE VENERABLE ORDER OF THE HOSPITAL OF ST. JOHN OF JERUSALEM.

HER MAJESTY THE QUEEN has honoured the following medical practitioners by promotion in or admission to the Venerable Order of the Hospital of St. John of Jerusalem:

Group Captain Sir Hugh R. G. Poate, Kt., M.V.O. (New South Wales), has been promoted from Knight to be Bailiff Grand Cross in the order.

Dr. Bertram Clarence Cohen (Western Australia), Lieutenant-Colonel Geoffrey Newman-Morris (Victoria) and Lieutenant-Colonel Frank Kenneth Mugford (South Australia) have been promoted from Officers to be Commanders in the order.

Dr. August Lyle Buchanan (New South Wales) has been promoted from Serving Brother to be Officer in the order.

Dr. Mervyn Harrie Eliot-Smith (New South Wales), Dr. Ronald Awstun Lewis (New South Wales) and Dr. Alexander Sandison (South Australia) have been admitted as Serving Brothers in the order.

## Nominations and Elections.

THE undermentioned has applied for election as a member of the Victorian Branch of the British Medical Association:

Metcalfe, Donald, M.B., M.S., 1953 (Univ. Sydney), c.o. Walter and Eliza Hall Institute, Royal Melbourne Hospital, Parkville, Victoria.

## Medical Appointments.

Dr. V. W. Potter has been appointed a member of the Medical Board (Port Pirie), pursuant to the *Workers' Compensation Act, 1932-1954*, of South Australia.

## Deaths.

THE following deaths have been announced:

BUDDEE.—Frederick William Buddee, on July 29, 1955, at Glen Innes.

FAULDER.—Kenneth Charles Faulder, on August 4, 1955, at Penrith.

JENSEN.—Frederick Jorgen Jensen, on August 2, 1955, at Sydney.

## Diary for the Month.

- Aug. 15.—Victorian Branch, B.M.A.: Finance Subcommittee.
- Aug. 16.—New South Wales Branch, B.M.A.: Medical Politics Committee.
- Aug. 17.—Western Australian Branch, B.M.A.: General Meeting.
- Aug. 18.—Victorian Branch, B.M.A.: Executive of Branch Council.
- Aug. 18.—New South Wales Branch, B.M.A.: Clinical Meeting.
- Aug. 23.—New South Wales Branch, B.M.A.: Ethics Committee.
- Aug. 24.—Victorian Branch, B.M.A.: Branch Council.
- Aug. 25.—New South Wales Branch, B.M.A.: Branch Meeting.

## Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

*New South Wales Branch* (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales.

*Queensland Branch* (Honorary Secretary, B.M.A. House, 225 Wickham Terrace, Brisbane, B17): Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

*South Australian Branch* (Honorary Secretary, 80 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

*Western Australian Branch* (Honorary Secretary, 205 Saint George's Terrace, Perth): Norseman Hospital; all contract practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

## Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

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